INDUSTRIAL MEDICINE AND SURGERY

The Journal of Medicine in Industry

With which are consolidated "The Industrial Doctor"® and "International Journal of Medicine and Surgery"

This magazine is published to promote sound thought concerning industrial medicine and the surgery of trauma. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited. The editors will exercise care in checking on the accuracy of data printed but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same in the current or any subsequent issues as they may be inclined.

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INDUSTRIAL MEDICINE AND SURGERY, The Journal of Medicine in Industry: Entered as second class mail matter August 28, 1941, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Reentered, October 3, 1949. Additional entry at Sheboygan, Wisconsin. Published on the fifth of each month by INDUSTRIAL MEDICINE PUBLISHING COMPANY, Chicago (publishers also of AMERICAN INDUSTRIAL HYGIENE ASSOCIATION QUARTERLY). STEPHEN G. HALOS, President; A. D. CLOUD, Publisher; CAREY P. McCORD, M.D., Editor; DORIS FLOURNOY, Editorial Assistant; HAROLD A. HOOPER, Treasurer; STEPHEN G. HALOS, Advertising and Business Manager. Member, Audit Bureau of Circulations. PUBLICATION, EDITORIAL and EXECUTIVE OFFICES, 605 North Michigan Avenue, Chicago 11, Illinois. Subscription $6.00 per year in the United States; $6.50 (U.S. Currency) per year in Canada; $7.00 (U.S. Currency) per year in other countries. Single copies 75 cents. Title Registered in United States Patent Office. Rd. Canada, 1942. Copyright, 1952, by Industrial Medicine Publishing Company, Chicago. CHANGE OF ADDRESS: FOUR weeks' notice required; changes cannot be made without old address as well as new; please furnish zone number for new address if city requires it.

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DONALD H. ECKLES, M.D., of General Electric's Medical Department at Richland, Washington, has been transferred to the G. E. Medical Department at Schenectady, New York. DR. ECKLES was born in 1906; received his medical degree at Harvard Medical School in 1932.

EDWARD MANSFIELD GUNN, M.D., has become the first Medical Director of the Sonoco Products Company, of Hartsville, South Carolina, which is in the process of developing and expanding its medical program. DR. GUNN was born in 1913, graduated from Syracuse University College of Medicine in 1939, and was formerly associated with the Army Institute of Pathology, Washington, D.C.

THE Medical Society of the State of New York, by resolution of its house of delegates at its recent annual meeting, directs the Society to "require as a condition for membership in the Society and its component county societies the signing and filing of an oath of allegiance to the United States."

Physicians Not Employees

IN A decision of widespread interest to physicians who as a group are exempt from Social Security taxes, Federal Judge Paul Jones, Cleveland, recently ruled that seven physicians rendering professional services for employees of the Willard Storage Battery Company plant in Cleveland could not be classed or taxed as "employees." The Bureau of Internal Revenue had interpreted the physicians' agreements with the company as employer-employee relations. The government had collected some $3,000 in social security taxes and other employment taxes on earnings of the physicians. The company had sued for recovery of the money. Whether or not the government will appeal the ruling of Judge Jones is unknown at this time. If sustained, the ruling will affect the status of many physicians who have similar agreements with industrial firms. In rejecting the government's contention that the physicians were employees of the Willard company, Judge Jones stated: "The evi-

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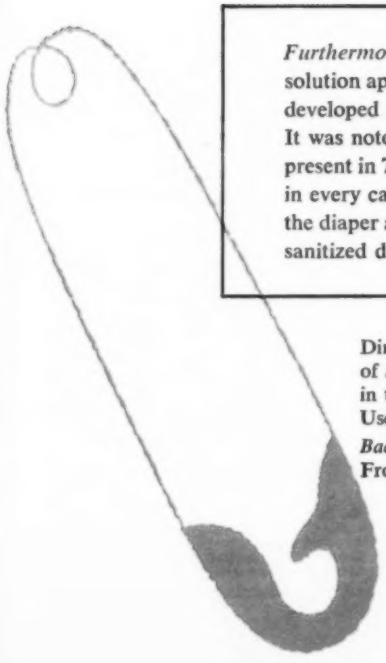

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dence shows that the physicians performed only part-time service for the company. During the years in question they maintained private practice to which most of their time was devoted. They were free to leave the company premises even during the hours they were scheduled to work, if an emergency case in their private practice required their presence. The compensation they received was only a fraction of their total income." Under these circumstances, the judge said, the Willard doctors could not be classified as employees under the social security statutes, which use the common law as the guide. He said the doctors' work or objectives were not supervised or directed by the company to such an extent that the doctors were in the company's control. "Professional services requiring a high degree of skill were contracted for," Judge Jones observed. "Direct control over the details and means by which the work was to be accomplished was not contemplated." Moreover, he said, the doctors were to act in accordance with medical practice, not company direction.

—Ohio State Med. J., May, 1952.

A Medical Problem

LEO J. WADE, M.D., of Esso Standard Oil Company, New York, in the current *AMA Archives of Industrial Hygiene and Occupational Medicine*, sets forth two approaches to the problem of alcoholism which he believes should be encouraged by industrial medicine. "First, management must adopt a reasonable attitude toward the problem and see to it that the same sane attitudes are inculcated in the various foremen and supervisors. The latter, in particular, must be made to realize that attempts to cover up for the alcoholic worker will ultimately be damaging rather than helpful to these men. Second, personnel managers can play an important role in the prevention of alcoholism. Frustration is often the end-result if workers are assigned to jobs which are either too easy or too hard for them. Such frustration often leads to excessive drinking. Similarly, a worker whose relations with his fellow workers are unfriendly tends to be maladjusted and may drink to overcome his shortcomings. Blind-alley jobs, with limited promotional opportunities, disagreeable

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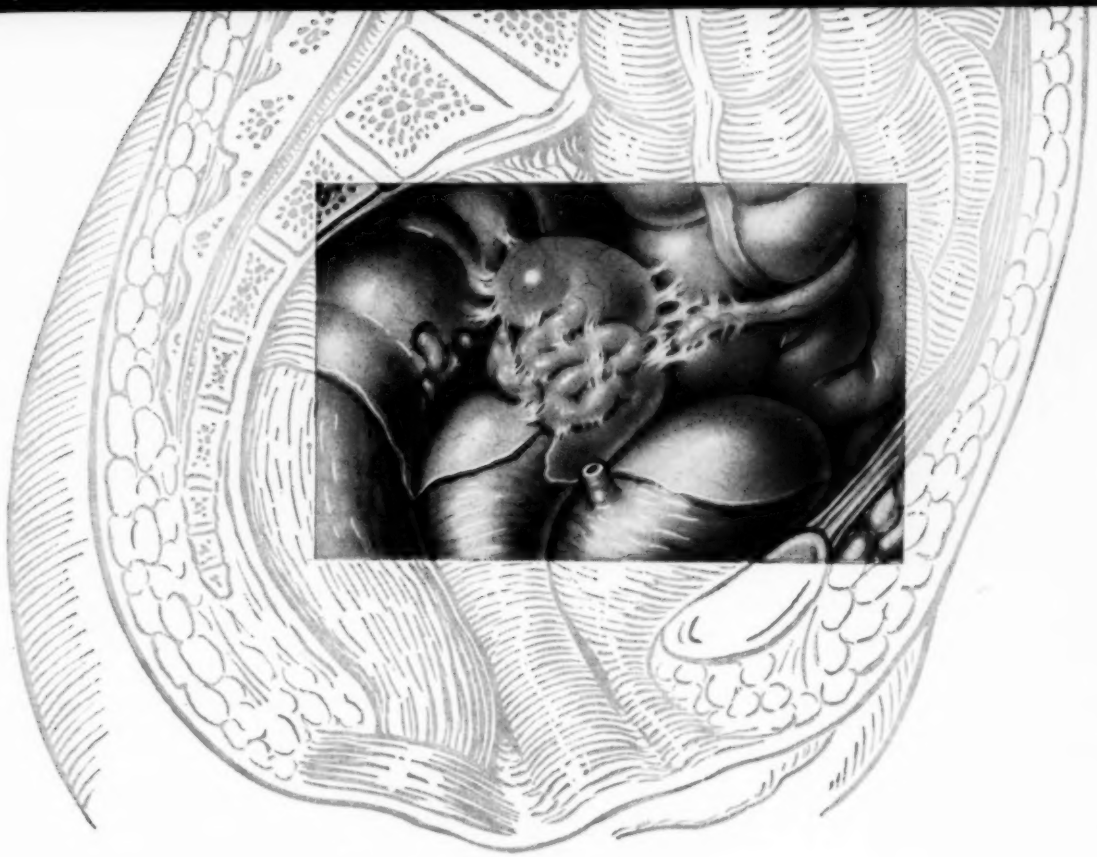

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1. Greene, G. G.: Kentucky M. J. *50*:8, 1952.
2. Stevenson, C. S., et al.: Am. J. Obst. & Gynec. *61*:498, 1951.

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work and low-interest jobs may drive men to drink. Personal problems may contribute to the tendency to resort to alcohol. Adequate recreational and social facilities may be of great help in supplying the worker with opportunities to relax and participate in social activities. Personnel officers, by more effective use of their techniques of selection, placement, training and promotion, can reduce alcoholism within their organizations." Careful attention given by the company physician at the time of periodic health examinations to the social and job history also can be helpful in preventing alcoholism. "Evaluation and treatment are primarily a medical problem, which should be approached in the same calm, unbiased, and helpful manner as any other health problem." Of 85,554 employees of Standard Oil (New Jersey) and its affiliates in 1950, only 37 were addicted to alcohol.

Recent Deaths

CHARLES G. FARNUM, M.D., 77, at Peoria, Illinois, April 24. DR. FARNUM was one of the founders of the American Association of Industrial Physicians and Surgeons. He served as a Vice-President of the Illinois State Medical society, and was a member of the board of directors of the International Medical association and the National Safety Council. He retired last August.

ELMER E. COLLINS, M.D., 68, at Chicago. DR. COLLINS was Assistant Medical Director, Swift & Company, Chicago, 1916 to 1949. He was graduated from Chicago Medical College in 1910.

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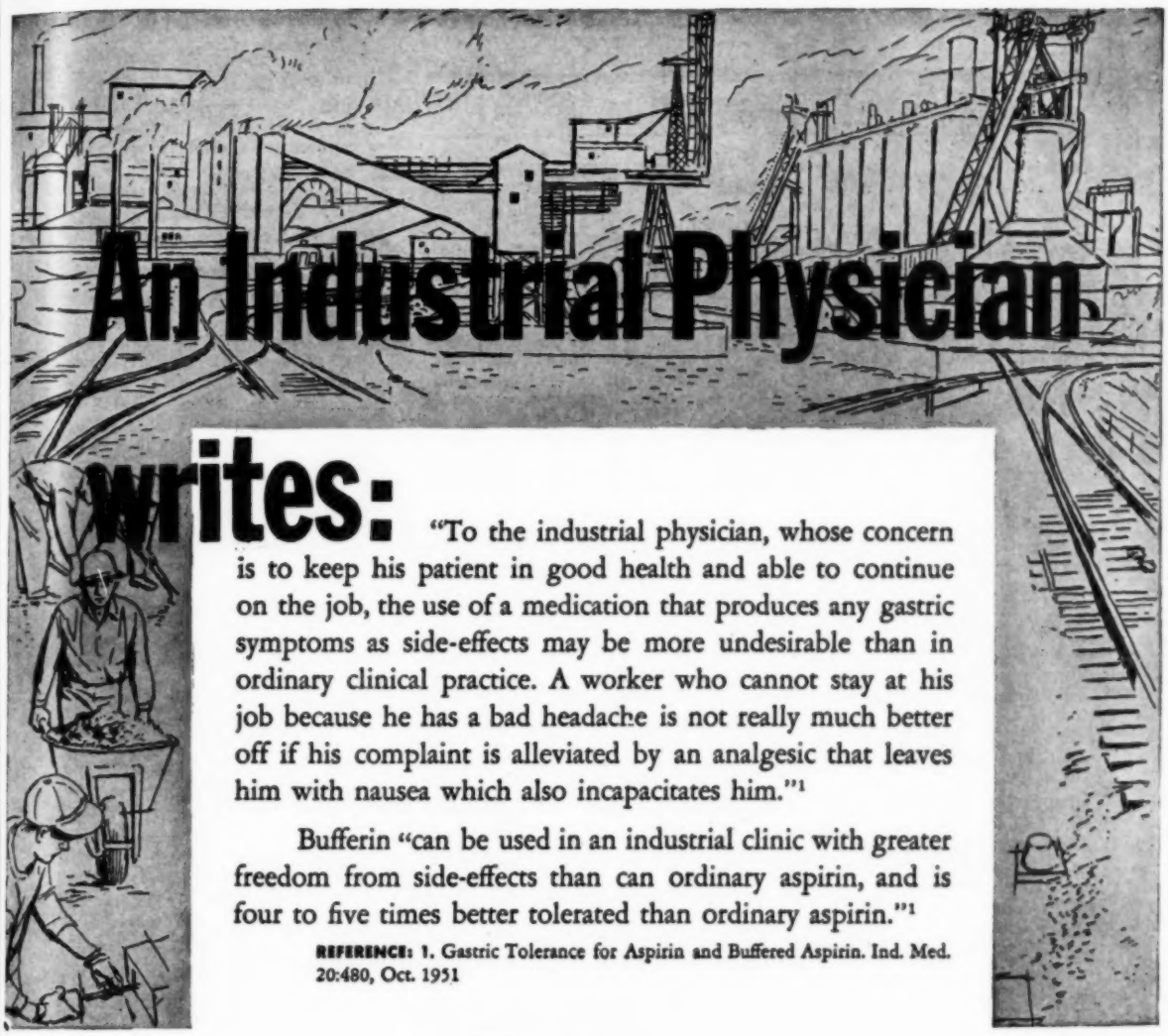

An Industrial Physician writes:

"To the industrial physician, whose concern is to keep his patient in good health and able to continue on the job, the use of a medication that produces any gastric symptoms as side-effects may be more undesirable than in ordinary clinical practice. A worker who cannot stay at his job because he has a bad headache is not really much better off if his complaint is alleviated by an analgesic that leaves him with nausea which also incapacitates him."[1]

Bufferin "can be used in an industrial clinic with greater freedom from side-effects than can ordinary aspirin, and is four to five times better tolerated than ordinary aspirin."[1]

REFERENCE: 1. Gastric Tolerance for Aspirin and Buffered Aspirin. Ind. Med. 20:480, Oct. 1951

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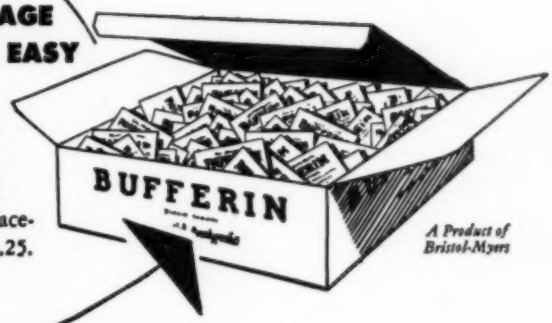

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XUM

THIS MONTH

IN DESCRIBING the Korean cease-fire debacle, *Life* (May 26, 1952) says: "Where the book called for a major general to sit in the armistice negotiations, any major general would do. Where the book called for a brigadier general to run a prisoner of war camp, any brigadier general would do." That's the Army! The insignia of rank seem the magic wand of wisdom. This is true also in the lower echelons. During the war the "book" called for psychiatric officers at various camps. These were appointed from the Medical Corps, and often, regardless of background, the title endowed them at once with the accumulated store of all there was to know about psychiatry. Industry hasn't any "book," but there is an analogy between the military procedure and the habit—common in the management of smaller concerns, and all too prevalent in medicine—of thinking that any M.D. can step into a plant and at once and thenceforth be an industrial physician. This is by way of pointing up a statement in DR. RONALD BUCHAN'S classic "Industrial Medical Practice—1952" (page 261): "It is not medicine alone which is required in industry, but medicine PLUS. It is the PLUS which distinguishes it as a special field, and without which medicine has little to offer industry." Quoting Walt Whitman, "Behold! these are vast words to be said." Nothing need be added. It is implicit that the medicine PLUS requires the M.D. PLUS. The biographical history of industrial medicine, clear back to Ramazzini, discloses that each man had his PLUS, that it was a function of his success—the principal component of his right to be known as an industrial physician. One brought one kind, another brought something else, a third contributed still more—each an individual PLUS, in each instance transcending the fact that its possessor was an M.D. Industrial medicine today is the sum total of their medicine *and* their PLUSES—and who can say which was the more important.... THIS issue contains many other expressions which, though their words may not be "vast," nevertheless have all shades of interest, from much to much more. One is the statement in DR. HERBERT KELLY'S "Psychosomatic Principles of Nutritional Therapy" (page 266): "In a single year, physicians requested six million reducing diets from one pharmaceutical house alone." Another is in DR. CARL GATTER'S "The Industrial Physician and the Workers' Home Problems" (page 273): "Every plant physician.... must realize that he is not using all of his talents." Incidentally, with all that has been said in these pages over the years regarding the fact that one of the principal duties—and privileges—of the industrial physician is to listen to employee questions, DR. GATTER'S account is the first time we have been really let in on what the questions are. A third is the powerful sentence on page 281: "For too long men of immature mind have held office." And once again, WHO, on the political horizon, could be the statesman David Lawrence talks about on page 302? That, however, is an easy question; the answer has four letters.... SPEAKING of Ramazzini, the photograph on this page, received from DR. J. F. MAHONEY, New York City's Commissioner of Health, shows Ramazzini's name among the immortals on the facade of his building.... AND the RAMAZZINI SOCIETY will gather for its 1952 Rendezvous at Highland Park, Illinois, on Friday, June 6...."NOISE—Causes, Effects, Management, Costs, Control," published by the University of Michigan School of Public Health and Institute of Industrial Health, is just in from the bindery, along with an early comment about it: "This book truly represents a compendium of all that is new and important in the field of noise control, prevention, and supervision." Copies of NOISE, while they last—the edition is limited—may be procured from the School of Public Health, University of Michigan, 109 South Observatory Street, Ann Arbor.... TOO late for the "Personal" column, comes the following note of a well-deserved tribute: "ROBERT A. KEHOE, M.D., of Kettering Laboratory, University of Cincinnati College of Medicine, recently received the annual award of the Technical and Scientific Societies Council of Cincinnati. The Council pointed out that, because of the dangers to health associated with the use of tetraethyl lead in anti-knock gasoline, its manufacture and distribution were voluntarily suspended in the early 1920's, until a plan of safety was developed by DR. KEHOE after intensive research." To this we would add that DR. KEHOE has many more distinctions....

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PHYSIOLOGIC THERAPEUTICS THROUGH BIORESEARCH

XUM

Industrial Medical and Related Chronology selected and arranged by ROBERT T. LEGGE, M.D., F.A.C.S., Berkeley, California

"The word idiot *is derived from the classical Greek* idiotes, *which meant 'those citizens who did not take part in public voting.' In ancient Greece it was because they could not; in the United States today it is because they do not—and the word* idiot *is still appropriate."*
—Ladies' Home Journal

♊ = Gemini — May 21-June 21 ‖ ♋ = Cancer — June 22-July 23

1952 JUNE

JUNE—the month that "what is so rare as a day in?" And a night, teeming with the sounds of season? And a crisp dawn, and dewdrops on the rose? With all its fresh beauty, June is a month of reality. Nature is great with the synthesis of Summer; the moon's the midwife when it yeans its fruit of tree, and vine, and grain. In spite of man, it comes, lights up his ersatz ways, smiles a little at his works and woes, and then goes back into eternal Time, hoping it will be remembered...

☽ 1st Quar. ○ Full Moon ☾ 4th Quar. ● New Moon

1 ♊ S — 1863—Hugo Munsterberg, eminent Harvard Professor, born. He conducted experiments of applied psychology to industrial life.
1896—Andrew Harvey, 1868-1949, became the first Medical Director in the U.S., at Crane Co., Chicago.

2 ♊ M — 1926—Lieutenant General Sir William Leishman, native of Glasgow, British Army surgeon, died. He discovered the Leishman-Donovan body, also the Leishman stain for plasmodium.
"Medicine heals doubts, as well as diseases"—Marx

3 ♊ Tu — 1657—William Harvey, discoverer of the circulation of the blood, died and was buried at Hempstead Church. Besides publishing his book "De Moto Cordes et Sanguines," he produced another, "The Generation of Animals."

4 ♊ W — 1864—William T. Fox, 1836-1879, English dermatologist, wrote the original description of porrigo (impetigo).
"I can remember when older physicians refused to recognize socially a man who devoted himself to the eye alone"—Weir Mitchell

5 ♊ Th — 1777—William Shippen, Director General U.S. Army hospitals, issued an order that only gentlemen of the best medical education, well qualified and skilled, should be selected in U.S. Army. And no cost should be spared to make sick and wounded soldiers comfortable and happy.

6 ♊ Fr — 1884—Theodor Weyl (1851-1913), German chemist, developed test for nitrates in urine.
1940—Leroy U. Gardner given the Knudsen Award at New York.
"Treat the man who is sick, not a Greek name"—Jacobi

7 ♊ ○ Sa — 1811—Sir James Simpson, born. Was Professor of midwifery at the University of Edinburgh; discoverer of chloroform as an anesthetic.
1939—Clarence Olds Sappington, M.D., given the first Knudsen Award, by General Knudsen, at Cleveland.

8 ♊ S — 1832—Cholera in New York City, caused 3,539 deaths.
"After watching the socialistic experiment in Britain, I concluded that only a rich country can afford socialism, and only the poor ones are foolish enough to adopt it" —Lewis Douglas

9 ♊ M — 1927—School of Hygiene, University of Toronto, opened.
1924—Royal Institute of Public Health held a Congress at Bordeaux, France. Professors Charles E.-A. Winslow, Raymond Pearl, Richard Strong, and R. T. Legge were American delegates.

10 ♊ Tu — 1910—The first National Conference on Industrial Diseases met at Chicago.
1937—The Council on Industrial Health of the American Medical Association was established; Carl M. Peterson, M.D., Secretary.

11 ♊ W — 1741—Joseph Warren, M.D., born at Roxbury, Massachusetts. Became a major general of Massachusetts Bay. Was killed at Bunker Hill, June 17, 1775.
"Nothing of worth or weight can be achieved with half a mind, with a faint heart, with a lame endeavor"—Barrow

12 ♊ Th — 1918—Colonel Frank Billings, distinguished Chicago physician, Chief of the Division of Physical Reconstruction, issued *Carry On*, a magazine for disabled service men.
"Most people can't stand prosperity," asserts a sociologist. Most people don't have to—Cincinnati Enquirer

13 ♊ Fr — 1868—Wayne University College of Medicine founded at Detroit, formerly Detroit College of Medicine and Surgery.
1771—The New York State Hospital incorporated.
"It never troubles the sun that some of his rays fall into ungrateful space"—Emerson

14 ☾ Sa — 1894—S. Kitasato (1852-1931), a Japanese at the plague epidemic at Hongkong, discovered the *bacillus pestis*.
"How is it that, one fine morning, Duchenne discovered a disease which probably existed in the time of Hippocrates!"—Charcot

15 ♊ S — 1860—The Nightingale Fund of £50,000 raised to establish a school for nurses at St. Thomas Hospital, London. Duly opened the era of modern nursing.
1862—Thomas C. Gilchrist, Johns Hopkins dermatologist, born. Was discoverer of blastomycosis.

16 ♊ M — 1904—Nathan Smith Davis died. Father of the A.M.A.; Professor, Rush Medical College, Chicago; organized the Illinois State and Chicago Medical Societies.
"It is better for a man to go wrong in freedom, than to go right in chains"—Huxley

17 ♊ Tu — 1761—George Baker, F.R.S., M.D., read before the College of Physicians, London, his classical essay "Concerning the Cause of the Epidemial Colic of Devonshire." Discovered it was due to lead in the cider presses. One of the outstanding epidemiological investigations in plumbism.

18 ♊ W — 1845—Charles L. A. Laveran born in Paris. A French pathologist, noted discoverer of the plasmodium of malaria. Nobel Prize, 1907, for medicine.
"The army has taken so many doctors, that some civilians are having to test their own cigarettes"

19 ♊ Th — 1822—Dr. William Beaumont called to treat Alexis St. Martin for the gun-shot wound which, as a gastric fistula, enabled Beaumont to study the stomach's digestive process.
1915—Edward C. Kendall, of the Mayo Clinic, isolated a crystalline form containing iodine in the thyroid.

20 ♊ Fr — 1830—Ephraim McDowell died at Danville, Kentucky. Father of ovariotomy. His statue was unveiled in Statuary Hall, U.S. Capitol, Washington, D.C.
"I seek the truth, by which no man was ever injured"—Marcus Aurelius

21 ♊ Sa — 1896—George F. J. Widal (1862-1929), Paris physician, discovered the sero-diagnostic test for typhoid fever.
"Experience teaches us to be most on our guard to protect liberty when government's purposes are beneficent" —Justice Brandeis

22 ● ♋ S — 1856—John H. Musser, eminent clinician and Professor at University of Pennsylvania; ex-president, A.M.A.; author of "Medical Diagnoses," born at Strasburg, Pennsylvania.
"The historic sequence: first, Big Government; second, Big Bureaucracy; third, Big Corruption"—Homer Ferguson

23 ♋ M — 1913—The Wellcome Historical Medical Museum at London was opened, with much ceremony.
"When you plant for a year, plant grass; when you plant for ten years, plant trees; when you plant for the centuries, plant men"—Chinese Proverb

24 ♋ Tu — 1852—Friedrich Leffler born at Frankfort on the Oder; M.D., at Wurzburg; while at the Government Health Office he isolated the bacillus of diphtheria, swine erysipelas, and glanders.
"Science commits suicide when it adopts a creed"—Huxley

25 ♋ W — 1907—Karl Burker, German physiologist, developed a method for estimating the coagulation time of the blood.
"It is comforting to think that there is always somebody more stupid than yourself. A kindly universe has seen to it that there always is"—Carl Burklund

26 ♋ Th — 1933—A. G. Weiss, a Belgian physician, introduced histidine hydrochloride in treatment of peptic ulcer.
"Socialism is competition without prizes, boredom without hope, war without victory, and statistics without end"—Charles Morgan

27 ♋ Fr — 1913—The International Health Commission created by the Rockefeller Foundation, its object the promotion of public sanitation and the spread of the knowledge of scientific medicine.
1820—Maine School of Medicine chartered by the State.

28 ♋ Sa — 1884—Theodor Weyl (1851-1913), German chemist, developed a test for carbon monoxide in the blood.
"In coughing, or sneezing, make not great noise, if it be possible, and send not forth any sigh, in such wise that others observe thee, without great occasion"—Bacon

29 ♋ S — 1860—Thomas Addison (1793-1860) died, at 68. Wrote in 1853 on the constitutional and local effects of disease of the suprarenal capsules called Addison's disease.
"He is not just an accident; he is a man with an injury"—Margaret Bruce, R.N.

30 ☽ M — 1861—Secretary of War appointed Dorothea Lyn Dix superintendent of female nurses during the Civil War. Among her nurses were Clara Barton and Louisa M. Alcott.
1906—United States passed the Pure Food and Drug Act.
1930—First world radio broadcast.

"Muscle and pluck forever!
What invigorates life, invigorates death,
And the dead advance as much as the living advance,
And the future is no more uncertain than the present,
And the roughness of the earth and of man encloses as much as the delicatesse of the earth and of man,
And nothing endures but personal qualities."
—*Walt Whitman*

XUM

INDUSTRIAL MEDICINE AND SURGERY
The Journal of Medicine in Industry
With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery"

Volume 21 JUNE 1952 *Number 6*

Clinical Orientation to Alcoholism

R. G. BELL, M.D.
Shadow Brook Health Foundation, Ltd.
Willowdale, Ontario, Canada

WITHIN the past 10 years general interest in a new understanding of alcoholism as a disease has been steadily increasing. As a result, a new awareness of the fact that alcoholism can be successfully treated has begun to result in significant changes in policy within industry, and many industrial physicians are now trying to come to grips with alcoholic problems in their own companies. The trouble has been to know where to start.

Many new clinical concepts of alcoholism have been suggested. Any physician who has attempted to acquire a new clinical orientation to alcoholism during the past five to 10 years could with little trouble find a great deal written about the condition. However, he would undoubtedly encounter considerable difficulty in realizing that many of these writers were actually talking about the same disease. One writer might stress alcoholism as a psychiatric disability, another as a state of dysfunction of the endocrine system and hypothalamus, and still another might emphasize the concept that alcoholism is related to imbalanced nutrition. Strangely enough, it is considered that all of these concepts are correct but that no one by itself serves to explain alcoholism.

This paper will attempt to present a clinical orientation to alcoholism that could be applicable in an industrial situation and could enable an industrial physician to recognize the various stages leading up to and following the development of alcohol addiction. It is not presented as a scientific treatise, but rather as a clinical method that in our experience is workable and readily understood by others.

A—Basic Orientation

OUR orientation to alcoholism begins with the following hypothesis.

1. It is theoretically possible to develop disease from chronic toxic exposure to any chemical. The toxic effect of any chemical is a function of the concentration or dose of the chemical and the duration or repetition of exposure. The higher the concentration, the shorter the time necessary to produce a toxic effect, and, conversely, the longer the time of exposure, the lower the concentration required to produce the same effect.

With most chemicals known to be toxic in industry, the dose and exposure below which few people are affected is determined. This dose and exposure factor is then divided by some suitable figure, often an arbitrary one, and set up as a "critical" exposure which is avoided, if possible. In this way, a margin of safety is established to take care of those few individuals in any population who are unusually susceptible.

In the case of alcohol, most people who use alcohol socially, repeatedly expose themselves to doses which are known to be toxic to some people. They hope to find out for themselves and on themselves what they can stand. Therefore, it is not possible to give any figure within the usual range of alcohol consumption which will be safe for everybody. It would be handy for educational purposes if a "critical level" of exposure to alcohol could be defined but, unfortunately, this is not possible.

The dose of alcohol and duration of exposure capable of producing disease vary with the individual.

Prevention must result from the individual's early recognition of toxic effects or from maintenance of sub-toxic doses or from total abstinence.

2. The nature of the chemical will determine the nature of the changes it produces in the body, and the organ systems that are primarily involved.

3. The real causes of disease involving chronic toxic exposure to chemicals are the factors responsible for a sufficiently prolonged, sufficiently intense exposure to break down individual resistance.

4. There are several chemicals in the anesthetic and narcotic group which are capable of altering metabolism and thereby changing the way an individual feels.

5. The chemical most commonly utilized for this purpose in North America is ethyl alcohol.

6. A study of the nature of ethyl alcohol should result in an appreciation of the nature of the changes produced by chronic toxic exposure to alcohol, the organ systems primarily involved, signs and symptoms, and treatment.

B—Nature of Ethyl Alcohol

BIOCHEMICAL PROPERTIES: Ethyl alcohol combines the biochemical properties of glucose and ether, and is chemically related to both. Since biochemistry is not readily understood by patients or employees who are not technically trained, this point may be emphasized and illustrated in the following way.

(glucose) $C_6H_{12}O_6$ minus $2CO_2 = 2(c_2H_6O)$ (ethyl alcohol)

2 (C_2H_6O) minus $H_2O = C_4H_{10}O$ (ether)

Glucose is an energy food, ether is an anesthetic, and ethyl alcohol is both an energy food and an anesthetic.

PHYSIOLOGICAL EFFECTS: (a) *Food Effect:*

1. Alcohol has an energy food value of seven calories per gram.

2. Approximately 90% of ingested alcohol is oxidized to carbon dioxide and water, the remaining 10% accounting for the smell of alcohol on the breath, and alcohol in the urine, perspiration and saliva.

3. The body can oxidize seven to 10 grams of alcohol per hour, which corresponds roughly to 1 oz. of whiskey or 8 oz. of beer. Thus, the maximum energy available in a 24-hour period from the oxidation of alcohol alone, is about 1600 calories.

4. Alcohol produces heat energy but is not considered capable of supplying the complex nutritional needs of the body tissues.[1]

5. The oxidation of alcohol occurs chiefly in the liver.

When assessing the contribution of the food factor to disease, it is helpful to think of this factor as if it were pure white sugar. If a person were to add to his diet, repeatedly, one to two thousand calories of sugar without balancing this extra caloric intake with an adequate amount of vitamins, he would begin to acquire beriberi and other disorders related to imbalanced nutrition and specific deficiencies.[2] These should be considered as secondary or side effects. Beriberi is frequently acquired by the person who experiences chronic toxic exposure to alcohol, but now it is more commonly referred to as alcoholic neuritis.

If a person drank so slowly that his body was able to get rid of the alcohol as fast as it was received, he could not acquire a disease from the anesthetic effect of alcohol but could still acquire disease from the imbalance in nutrition associated with the food effect. Most of the pathology associated with the food effect should be considered reversible and curable except in the very late stages. The most significant changes in the body produced by alcohol are those resulting from its anesthetic effects, and at least one of these changes is considered to be irreversible for all practical purposes, with present medical knowledge.

(b) *Anesthetic Effect:*

1. The anesthetic effect is experienced while the alcohol is "waiting for oxidation." Thus, the anesthetic effect will be related to the rate of alcohol intake in excess of alcohol elimination by oxidation and excretion.

2. As an anesthetic, ethyl alcohol is approximately one-third or one-quarter as effective as ether; that is, it would require about three or four times as much alcohol as ether to produce any specific state of anesthesia.

3. According to Harris,[3] anesthetics are believed to produce their effect by interfering with three important stages in the oxidation of glucose. When explaining this concept to patients, we point out that the body has a complex "ignition system" to burn glucose; that glucose is our most important energy food; and that an anesthetic produces its effect by "turning off" part of the ignition and thereby reducing the activity and energy of certain body cells. If this concept should prove to be correct, it would mean that alcohol can *only* produce its anesthetic effect at the expense of the stability of the mechanisms in our body that are involved in the oxidation of glucose.

4. An anesthetic acts most obviously on nervous tissue, and the degree of functional disturbance appears to be greatest on the highest and most complex brain centers. As an anesthetic, alcohol, according to dosage, can duplicate the therapeutic effects of the various drugs described as sedative, hypnotic, analgesic, and narcotic.[4] The first effect of alcohol is to decrease inhibitions and the tension, resentment or anxiety involved in the maintenance of inhibitions. This cortical effect is achieved with relatively low concentrations of alcohol. The hypnotic and narcotic effects, which could be sought from earliest alcohol exposure by more seriously disturbed people, require higher concentrations of alcohol since lower brain centers are also involved.

5. It is believed possible that other tissues, e.g., endocrine system and liver, may be either directly affected by the anesthetic action of alcohol, or indirectly affected through the primary brain disturbance.[5]

Thus, in summing up the nature of ethyl alcohol, it is a chemical capable of directly disturbing metabolism, and, at the same time, and in another way, interfering with metabolism through disturbance or balanced nutrition. Functional and eventually structural changes in cerebral cortex, endocrine system and liver should be looked for, as well as the changes in the peripheral nervous system and elsewhere associated with the imbalanced nutrition. With a chronic disorder, one should expect a steady increase in malfunction of these organ systems as the disease progresses.

C—Clinical Orientation

FOR purposes of clinical orientation, an attempt will be made to classify all drinking into seven phases or categories. This is based on

a clinical analysis of the "Phases in the Drinking History of Alcoholics," by E. M. Jellinek.[6] The signs and symptoms, organ systems involved, pathology, and suggestions regarding the treatment role of the industrial physician, will be discussed for each category. Phases 3, 4, 5 and 6 are of particular significance in the industrial situation.

1. *Non-Dependent or "Social" Drinking:* Non-dependent drinking refers to drinking for other than clinically recognizable anesthetic effects. With this type of drinking, which fortunately is the most common, the flavor of a drink is important, the social occasions on which drinking is encountered are chosen, and the association with people is more important than the fact that alcohol may be served. Only the mildest anesthetic effects are enjoyed, and alcohol is considered a beverage like tea or coffee. Even mild intoxication is rarly encountered, so hangovers are mild and infrequent. This type of drinking is considered to result in an insufficient exposure to ethyl alcohol to produce disease in the vast majority of people even though it might be maintained for 50 to 60 years of adult living.

2. *Dependent Drinking:* This refers to a type of drinking involving personal dependence on certain anesthetic effects. The dependence may be associated with all degrees of maladjustment from mild feelings of unease to complete psychosis. However, if the employee has been employed for one or two years it is unlikely that his dependent drinking is associated with the more severe psychiatric disabilities. Dependent drinking may follow first exposure to alcohol if, at the time of first exposure, the person is the victim of chronic or periodic states of resentment, tension or anxiety. Dependent drinking may be acquired later if reactive tension states to adult responsibilities and frustrations are found to be relieved by the anesthetic effect of alcohol. Even with negligible states of frustration one could acquire dependence and a chronic toxic drinking pattern by habitually "doing in Rome as the Romans do" in social or industrial situations involving excessive drinking. One could change from non-dependent to dependent drinking at any time. Even though all drinking is still undertaken on social occasions, the employee using alcohol in this way is no longer a social drinker. Now alcohol is more important than the people present at the time of drinking. Fleetwood and Diethelm[7] have demonstrated conclusively that alcohol effectively and quickly reduces emotional states involving resentment and frustration. Furthermore, the reduction in resentment and corresponding release from tension may persist for days following one effective exposure to alcohol. The employee with such emotional states encounters effects from alcohol that are not experienced by the person who is fortunate enough to be free of them. Thus, from the very start of drinking the non-dependent drinker has difficulty in understanding the dependent drinker, and vice versa. The assumption of dependent drinking should be considered the *first* warning that a type of drinking has been acquired that could lead to a sufficient exposure to ethyl alcohol to produce disease.

When one attempts to find common factors in those who become dependent drinkers, we find that they are essentially the same kind of people, with the same kind of problems, and the same kind of emotional responses to these problems, as those who do not become dependent drinkers. If the dependent drinkers have common features, it would appear to be an inability or unwillingness to share these problems with other people at the right time, plus an initial metabolic acceptance of higher alcohol intake. Important personal issues are kept to themselves and friendships are maintained on a superficial plane. Denied the opportunity to share deep problems with others, they are denied the normal emotional outlets that are provided by adequate interpersonal relationships. Such people seem to accept readily a form of pseudo-security from the effect of chemicals, a method of adjustment that attempts to deny that man is and always has been a social animal. The underlying pathology of the dependent drinker could be related to those factors in infancy or childhood which later prevented him from establishing adequate, emotionally satisfying relationships in adulthood, plus an inherited pattern of metabolism that is susceptible to the chronic toxic effect of ethyl alcohol.[8]

The signs and symptoms, at this stage, are all related to this underlying pathology which persists throughout all later phases although it gradually is pushed into the background by the addition of alcoholic pathology. As yet, there is no pathology related to the chronic toxic effects of alcohol. The dependence upon the anesthetic effect of alcohol should be viewed as the first "half" of craving for alcohol—the controllable half that varies greatly in intensity from person to person. If such an employee is encountered by an industrial physician, an effort should be made to persuade him to accept any necessary psychological or social assistance that could enable him to deal more adequately with unpleasant emotional states. The decision to drink or not to drink could be left to the employee and his physician. This condition of dependence could be identified in routine examination and history taking, and preventive measures instituted.

When working as an industrial physician a few years ago, it was my experience that employees were quite willing to discuss even excessive drinking as long as it was still under control. I was also impressed with their willingness to cooperate in a plan to change their drinking to a less dangerous type.

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3. *Increase in Tolerance:*
This phase of drinking may follow very soon after the beginning of dependent drinking. It is considered that at this stage dependent drinking has also become chronic toxic drinking. The increase in tolerance to alcohol could represent the first effort of the body to adjust to a chronic toxic experience. This should be considered as the second warning that disease from alcohol could result.

As the body is forced to adjust to a certain alcohol consumption, the formerly effective blood alcohol level is no longer capable of meeting the individual needs. Thus, more alcohol must be consumed, the body again adjusts, and so on, until the limit of metabolic adjustment to this toxic experience is reached in a particular individual. This employee is now called a "heavy drinker," and for clinical purposes all heavy drinkers could be considered dependent drinkers whose drinking has also resulted in an increase in tolerance. In other words, there is no safe way to indulge in heavy drinking.

The pathology at this stage is still the underlying pathology. Since alcohol has not yet produced significant metabolic changes, the dependent drinker still retains the ability to eat and sleep. He does not suffer from any indication of disturbance in carbohydrate, fat, water or mineral metabolism. Thus, we do not see the sweats, shakes, cramps, lack of appetite, or craving for sugar. However, this employee is forced into a different method of drinking. In order to reach the effective blood alcohol levels demanded by this increased tolerance, he must change from sipping drinks to gulping them. He will not encounter sufficient alcohol on most social occasions to meet his needs, so the practice of "sneaking" drinks will be established.

Unfortunately, today it is considered that many so-called social drinking occasions do not represent social drinking as previously outlined, but rather mass dependent drinking and frequently mass dependent drinking with increased tolerance. Otherwise, there is no explanation for the amount of alcohol supplied and consumed by groups of people on many so-called social drinking occasions. This particularly applies to industrial conferences. In other words, it is becoming less and less necessary for the dependent drinker with high tolerance to sneak drinks in order to get enough to meet his needs.

A significant symptom is encountered towards the end of phase three, namely, the blackout. This temporary period of amnesia concerning the happenings during a drinking occasion, could indicate the third warning, and usually means that disease from alcohol is imminent. It could be an anoxic effect on the cerebral cortex, as a result of disturbance in enzyme function in cortical cells. Since the cerebral cortex is the first to be affected by anesthetics, it is to be expected that it will show the first disturbance in function. The first warning—namely, the beginning of dependent drinking—may have occurred about 10 years previously. When black-outs occur, it has been my experience that possibly one or two years of dependent drinking are left before *irreversible* metabolic changes begin.

If the industrial physician feels that he has encountered an employee or executive in this phase of drinking, he should again think in terms of prevention. Phase three is the last phase in which prevention is possible. The physician should try to explain the phase, and I further suggest that he recommend to the employee that he try to discontinue drinking entirely for at least one year. During this year, the physiological mechanisms that have been trying to adjust to a chronic toxic experience would have an opportunity to become reorganized and the tolerance for alcohol could go down. However, such a person should also be advised to take advantage of the year and actively seek assistance in dealing with unpleasant emotional states in a more satisfactory and less dangerous fashion. A few sessions with a psychiatrist could be helpful if it is considered that the underlying emotional problems are severe.

4. *Disease Associated with the Anesthetic Effect of Alcohol Begins:*
Prior to this phase, dependent drinking could be undertaken at will and discontinued when desired. Now, the second "half" of craving associated with metabolic change is gradually added to the clinical picture. The employee can no longer discontinue drinking easily if he wants to. When he starts to drink he usually ends up intoxicated but, at first, only for one evening. Very soon his loss of control extends to a week-end, and the week-end bender becomes a factor in his domestic relationships. This is the stage at which we believe real addiction with irreversible metabolic changes is being established.

In keeping with the theories of Gross,[9] Tinterra and Lovell,[10] Smith[5] and others, we believe that this metabolic change involves changes in endocrine and enzyme function. It is also believed that the pituitary gland and the cortex of the adrenal gland are most significantly affected, as well as the enzymes involved in carbohydrate metabolism. The physician should now appreciate that this employee has reached the point of "no returning." He has the alternatives: either learn to live happily without alcohol in spite of his dependence on it, or inevitably progress through the later phases of disease with ever-increasing dependence, both physiological and psychological.

As the metabolism of the drinker is forced further and further away from its pre-toxic state, the metabolic signal of hunger which characterized the former state is believed to be gradually "left behind" and a new sensation of physiological craving for the agent that maintains the new abnormal state is experienced. From this time on, metabolic equilibrium is

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more and more seriously disturbed by continued alcohol exposure, and after a drinking experience a more normal metabolic state is acquired with increasing pain and difficulty. Thus, the employee begins to encounter the withdrawal reaction after drinking.

It is usually difficult to persuade anyone at this phase that he must discontinue drinking entirely. He has not suffered much from his drinking. For years it has been a quite effective means of making life tolerable. His dependence on alcohol has reached the point that he is frightened at the very thought of being forced to live without it. If this employee is to be persuaded to undertake the effort involved in learning to live satisfactorily without alcohol, a great deal of tact and patience must be used by the physician. He might be a rather poor candidate for Alcoholics Anonymous, since it will be at first difficult for him to believe that many of the men he meets in AA were at his stage of the disease 10 or 20 years earlier.

Thus, the treatment is essentially the same as that of the employee in Phase 3, except that this employee could not return to controlled drinking at the end of one year. However, it would be difficult, in some cases, to decide whether an employee was in Phase 3 or Phase 4. One might gain his cooperation by suggesting the same procedure as in Phase 3, namely, one year's abstinence followed by a trial of drinking. If the drinking again rapidly began to get out of control, it would be convincing to the therapist at least, and, possibly, to the employee. This could provide a good use for antabuse if properly supervised by a physician.

5. *The Phase of "Alcoholic Thinking":* Maintaining an ever-increasing dependence upon alcohol, with an ever-increasing inability to control drinking, the employee now is forced into an involved system of rationalization, alibis and lying concerning his drinking. The apt term of "alcoholic thinking" is borrowed from AA. This phase, which may extend for five to 10 years or even longer, is one in which the fear of facing life without alcohol still exceeds the fear of the consequences of continued uncontrolled drinking. The period is characterized by benders extending into the week, solitary drinking, attempts at the water-wagon, changing the drinking pattern, periods of remorse, extravagant behavior, and new resentments.

One of the most significant developments in this phase is the "morning drink." When the withdrawal reaction becomes so severe that it cannot be endured while carrying on a pretense of normal work, the morning drink becomes essential. It is considered to represent an essential aspect of the maintenance of an abnormal metabolic state which, however, has become "normal" for that individual. The morning drink should be regarded as absolute proof that all drinking should be discontinued permanently.

This is the most important phase from the standpoint of the industrial physician. He will not be so concerned with Phases 6 and 7 since in these phases the person affected has likely lost his capacity to hold any job at all. This is the phase during which the foreman will have more and more difficulty in covering up for an old employee. If he turns up for work on Monday morning, he will be in poor condition; he will be more accident-prone for the first half of the week; will hold up a production line; and will contribute heavily to the scrap heap.

Pathology

THE employee in Phase 5 should be considered to be suffering from a progressive impairment in both cortical and endocrine function. When he drinks now, there is likely a marked impairment in his ability to eat. This aggravates the imbalance in nutrition. His thinking should not be considered as anything like his best thinking, and will represent a regression towards a more infantile pattern of adjustment. About 50% of the obvious pathology could be considered the underlying pathology that led to dependent drinking. The other 50% should be considered as related to the chronic toxic effect of ethyl alcohol.

We were taught as medical students that fats burn in the fire of carbohydrates. Since we believe that the primary disturbance produced by the chronic anesthetic effect of ethyl alcohol is one of carbohydrate metabolism, this, along with dietary deficiencies, may partly explain why there is frequently evidence of disturbance in fat metabolism. Thus, beginning at least at this stage, one should look for a fatty liver and possibly check liver function routinely. It is unlikely that many of these fatty livers will have advanced to severe cirrhosis as yet.

Treatment in Phase 5

TREATMENT must begin by breaking up the pattern of alcoholic thinking; otherwise, nothing else that will be undertaken could possibly be effective. A calm discussion of developments up to this stage by the physician can frequently accomplish this in one or two interviews, and get the employee started on a treatment and rehabilitation program. Medical treatment will be according to whatever metabolic disturbances are clinically evident. If the employee can be persuaded that he has acquired a disease, he should be referred to the agency most likely to make it possible for him to acquire freedom from his dependence on alcohol. AA should be first considered, but one should not refer a patient to AA and forget about him. He may or may not find within this organization the satisfactory deep interpersonal relationships that he should have had many years before and that can be utilized successfully during periods of excessive frustration, resentment or tension.

If motivation for the effort involved in learn-

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ing to live happily without alcohol is poor, the employee may have to be referred to a special clinic or institution for a more comprehensive orientation to his particular problem. For this reason, the industrial physician should know what orientation and clinical facilities are available in his particular vicinity. Unfortunately, there are few orientation centers, and at least one should be available for each large metropolitan area.

A physician should not become discouraged if there are a few relapses at first with a particular patient. One must keep in mind that there are also frequent relapses with diabetics and others who are forced into the effort involved in acquiring a new way of living because of an irreversible pathological condition.

6. *New Fears:*
In Phase 6, the fears of continued drinking begin to balance the fears of not drinking. The employee is afraid of his blackouts which have become more severe and more prolonged. Not knowing what he has done in a blackout, he is afraid to answer the door or the telephone. He has become concerned over his supply of alcohol. Since no one else is concerned over this commodity, he is forced to hide it. Sometimes he hides it while in a blackout, and I am informed by patients that this represents the ultimate in human frustration.

If he is at the superintendent or executive level in industry, he may still be working, but many laborers lose their jobs in Phase 5. If properly handled, he is an excellent candidate for treatment and should be a good prospect for Alcoholics Anonymous. Now, a medical examination and medical treatment are definitely indicated and should be either undertaken by the industrial physician or by a competent outside physician. Alcoholic pathology is more clinically evident than underlying pathology. The employee might benefit by referral to a psychiatrist, providing the psychiatrist is aware that he is dealing with a chronic toxic disorder associated with a particular chemical, as well as the personality problems that were initially responsible for the toxic exposure and other personality problems acquired as a result of it. We still encounter patients who have been treated by a psychiatrist who has not appreciated that at the completion of psychiatric treatment the patient is still unable to drink in a controlled manner, even though the psychiatric aspect of treatment has been well carried out.

7. *Late Phase:*
If a person has been unable to find help during an earlier phase, he will not likely still be an employee at this phase. Thus, we shall refer to him as patient rather than employee.

If the patient reaches the point where the fear of continued drinking exceeds the fear of facing life without alcohol, and he has been unable to find assistance, he will enter this phase. Benders get closer and closer together; he drinks to relieve symptoms of former drinking; he tries to stop and can't; and the whole experience feels like a headlong plunge into oblivion.

Other chronic alcoholic clinical entities become apparent in the withdrawal period—delirium tremens, alcoholic convulsions, Wernicke's disease, Korsakoff's disease, severe neuritis, cirrhosis of the liver, etc. The patient now should have hospitalization at the completion of a bout. However, if mental deterioration has not taken place, he should be considered a good candidate for treatment.

By Phase 7, practically all of the pathology that is first seen by the physician is due to the chronic toxic effect of ethyl alcohol. The underlying pathology has been covered over by the alcoholic pathology and it might only become evident after a considerable period of abstinence. Goldfarb and Berman[11] found that postmortems on old alcoholics frequently revealed atrophy of the adrenal cortex and sex glands, and resembled the changes seen in hypophysectomized animals. Atrophy of cerebral cortex and liver has been recognized for a long time in advanced cases of alcoholism. The functional changes have gradually resulted in organic change in these organ systems.

The seven stages which have been described fit the bout or periodic drinker better than they do the chronic drinker. First of all, the chronic drinker usually is looking for less drastic anesthetic effects from alcohol than the bout drinker. All aspects of disease are acquired more gradually and insidiously. Whereas the bout drinker by Phase 6 will have lost the ability to eat within one or two days of a bout, the chronic daily drinker retains the ability to eat something even though many aspects of disease are far advanced. More serious food effects will be noticed. Peripheral neuritis and cirrhosis will be common. The change in cerebral function is much more gradual. The chronic addict does not suffer from withdrawal reactions and will progress to much later stages of the disease before he will be convinced that he has disease. Most bout drinkers will be seeking treatment in their thirties and forties; chronic drinkers in their fifties, sixties or seventies. Mental deterioration will be more commonly encountered in the chronic addictive drinker when he first seeks treatment. He will show all of the rationalization and resentments of the bout drinker but usually with less remorse. Blackouts may not be encountered until very late in the disease. When he finally loses the ability to eat at all while drinking, he is forced into a periodic pattern, and the withdrawal reaction will likely be even more severe than with the bout drinker. Alcoholic convulsions and delirium tremens are likely to occur during the withdrawal period unless he is very carefully treated.

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Practical Application

THE industrial physician is too busy to spend a great deal of time investigating each alcoholic case that comes to his attention. The figures may demonstrate a method to help trace a particular alcohol history quickly, assess alcohol status, and follow future progress.

ALCOHOL HISTORY: The first (Fig. 1) enables one to plot the succession of alcoholic events up to the time of the interview. It is the alcoholic history in graphic form.

ALCOHOL STATUS: We have developed a method of grading a patient without becoming involved in pages of reports. It is considered that such a method could be readily used in an industrial Medical Department.

We assign to each patient a "Dip Profile." The following indicates what each letter in Dip Profile refers to.

D uration of illness
I nsight (1 to 5)
P rognosis (1 to 5)

P hysical changes (1 to 5)
R ecovery motivation (1 to 5)
O ccupational stability (1 to 5)
F amily stability (1 to 5)
I ntellectual capacity (1 to 5)
L cohol dependence (1 to 5)
E motional stability (1 to 5)

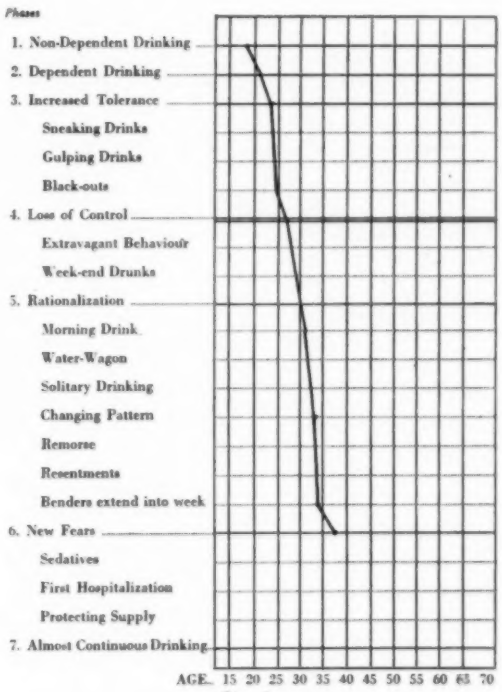

Fig. 1.
Development of Alcohol Dependence and Disease.

DIP

DURATION OF ILLNESS (to be expressed as number of years of psychological dependence on alcohol over number of years of psychological plus physical dependence) e.g., as in Fig. 1 $^{-5}/_{15}$.

INSIGHT

I 1—Understands and accepts psychological and social factors leading to dependence, nature of bodily changes produced by alcohol, and nature of effort involved in gaining freedom from dependence on alcohol.
I 2—Accepts that alcohol has produced disease but has doubts as to factors leading to dependence.
I 3—Accepts alcoholic disease but rejects reasons for dependence.
I 4—Very little understanding of illness.
I 5—No understanding of illness.

PROGNOSIS

P 1—Likely steadily to recover from dependence on alcohol without relapses.
P 2—Likely to gain complete recovery after initial difficulties.
P 3—"Much Improved Grade (c)" best possible prediction at present.
P 4—"Somewhat Improved" only possible prediction at present.
P 5—Hopeless.

PROFILE

PHYSICAL CHANGES

P 1—No evidence of physical damage to liver or nervous system.
P 2—Slight change, unlikely to require treatment.
P 3—Remediable impairment with proper treatment.
P 4—Partially remediable, serious enough to require long-term treatment and likely to modify future activities for its own sake.
P 5—Irremediable, unlikely to recover; e.g., advanced cirrhosis.

RECOVERY MOTIVATION

R 1—Good insight. Balanced awareness of own abilities and need for assistance for prolonged period.
R 2—Motivated by real or imagined fear of physical or mental consequences of continued exposure to alcohol.
R 3—Fair insight, but likely to have either too little or *too much confidence* in his own abilities, with a corresponding impairment in his recognition of the need for help from outside sources.
R 4—Motivated by external pressures or coercion.
R 5—No motivation.

OCCUPATIONAL STABILITY

O 1—Returning to secure relationship with employer or associates.
O 2—Returning to former job which has been slightly threatened.
O 3—Returning to former job but "one more slip and out."
O 4—Has lost job but still likely to get work of similar nature.
O 5—Work record ruined.

FAMILY STABILITY

F 1—Returning to secure, understanding relationship with family.
F 2—Some remediable family tension; no evidence of break-up.

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F 3—Severe family dissension; danger of break-up.
F 4—Family broken up. Some hope of repair.
F 5—Family broken up. No hope of repair.

INTELLECTUAL CAPACITY

I 1—No intellectual impairment.
I 2—Intellectually impaired slightly, and temporarily.
I 3—Intellectually impaired but able to appreciate most aspects of treatment.
I 4—Intellectually impaired to degree that treatment will be difficult.
I 5—Intellectually unable to participate in treatment.

ALCOHOL DEPENDENCE

L 1—Showing first signs of an abnormal dependence on alcohol. (Phases 2 and 3)
L 2—Dependence on alcohol growing but still faces up to most of life situations without intoxication. (Phase 4)
L 3—Dependence on alcohol severe but definite evidence of residual ability to adjust without it. About "50 to 50" proposition. Both physical and psychological dependence. (Phase 5)
L 4—Dependence on alcohol practically complete but still evidence of struggle to adjust otherwise. (Phase 6)
L 5—Dependence on alcohol for all significant adjustments; no effort to adjust otherwise. (Phase 7)

EMOTIONAL STABILITY

E 1—Rare. Normally stable. Social factors and metabolic susceptibility have played dominant role in development of dependence.
E 2—Stability fair. Will not likely require psychiatric assistance. Social factors have played significant role in development of dependence on alcohol.
E 3—Treatment possible and prognosis good if some psychotherapy initially. May require further psychiatric assistance after six months to one year.
E 4—Treatment possible but difficult and only if accompanied by intensive, prolonged psychotherapy.
E 5—Emotional instability of a serious enough nature to make likelihood of effective treatment impossible.
(Ed—Developmental factors resulting in residual disability in adulthood (significant in 3, 4, and 5).
(Er—Reactive factors in adulthood chiefly responsible (e 1 and 2).

An example of Dip Profile could be:

D	I	P	P	R	O	F	I	L	E
$^{5}/_{12}$	2	2	2	2	3	4	1	4	3

"Duration of illness" is expressed like a blood pressure reading. It refers to the number of years of dependent drinking prior to Phase 4, over the number of years of dependent drinking following Phase 4. One must keep in mind that this is more difficult to determine in the chronic addict. The rest of the letters are given a grading of one to five. If the profile is filled out completely, it will indicate that a fairly complete examination of a patient has been undertaken.

Low gradings of 4 or 5 under "Insight," "Recovery Motivation," "Intellectual Capacity," and "Emotional Stability" are particularly significant from a prognostic standpoint. Prognosis should be assessed last. If recovery motivation and insight are good, one does not need to be too concerned initially over low gradings in the rest of the profile. One should withhold definite grading on "Intellectual Capacity" in an advanced alcoholic until a month or so has elapsed during which his cortical cells have an opportunity to function without anesthetic impairment.

The physician, nurse, or even employee, could quickly learn how to fill in the graph, and, following this, the physician and nurse should be able to make a reasonably accurate profile. The first profiles on any patient are always tentative, but if the employee has been persuaded to undertake a treatment and rehabilitation program, later profiles will be more significant from a long-range standpoint. I suggest that employees could be asked to fill out their own graph for development of alcohol dependence and disease. If your efforts to guide an employee into a therapeutic situation have been successful, you could change his Dip Profile from time to time and be abreast of the treatment and recovery situation.

Alcoholic Recovery

RECOVERY should be gauged in terms of recovery from dependence on alcohol. When you can grade an employee "L-1," under his Dip Profile, his "Lcohol Dependence" is over.

Recovery Scale for Dependent Drinking

1. RECOVERED

Grade (a)—(This classification applicable only after four years uninterrupted total abstinence.)

All dependence on alcohol gone and replaced by a new system of satisfactory, mature adjustments and values.

Grade (b)—(This classification applicable only after two years uninterrupted total abstinence.)

Dependence on alcohol appears to be gone and to be replaced by a progressively improving new system of satisfactory, mature adjustments and values.

2. SOCIALLY RECOVERED—(This classification only applicable one year after completion of initial treatment.)

(a) Has illness under control. No relapses. Patient aware of a progressive improvement in capacity to adjust to life without former recourse to alcohol.
(b) No relapses. Retains good motivation but still has significant psychological, social or metabolic problems. Requires further assistance.
(c) Occasional relapses not severe enough to impair new social status (home, employment, community, etc.). Retains good motivation but definitely requires further assistance.

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3. MUCH IMPROVED—(This classification applicable during first year and after first month following completion of initial treatment.)
   (a) Has illness under control. No relapses. Patient aware of a progressive improvement in capacity to adjust to life without former recourse to alcohol.
   (b) No relapses. Retains good motivation but has significant psychological, social or metabolic problems. Likely will require further assistance before he can improve.
   (c) Occasional relapses not severe enough to impair new social status (home, employment, community, etc.). Retains good motivation but definitely requires further assistance.
4. SOMEWHAT IMPROVED—(This classification applicable after first month following completion of initial treatment.)
   Relapses occurring severe enough to jeopardize social status (home and work) but improvement in motivation and effort over pre-treatment period quite evident. Must have retention of sobriety for at least one month. Requires further assistance at once.
5. UNIMPROVED—(This classification applicable at any time.)
   (a) No noticeable change. Still considered candidate for treatment.
   (b) Considered to be a hopeless candidate for any type of treatment at present time.

We use a graph to plot recovery, as we use a graph to plot development of the disease. This method of assessing progress of alcoholic patients is a modification of that suggested by Jacobsen for use in following results of antabuse medication. Even when a patient actively cooperates in a therapeutic situation, in which his dependence on alcohol is progressively shifted to a new dependence on his interpersonal relationships and in a new faith in himself and his purpose in life, one should not consider that patient or employee recovered and suitable for L-1 classification until he has attained an unbroken period of four years' complete abstinence. A recovered patient is one who has no more meanings for alcohol; one who has found more satisfactory alternative means of dealing with all kinds of potentially frustrating or worrying situations.

Fig. 2 indicates the use of the graph in the rare case of complete recovery with no relapses. Some patients will remain in the category of "somewhat improved"; some in the category of "much improved"; and others will not go beyond "socially recovered grade (c)." However, if enough physicians will undertake this examination and follow-up of patients sincerely, in a relatively short time we should be in a position to recognize that a certain profile has a certain prognosis. We should also begin to find out which patients are likely to be helped by AA, and which will require further specific assistance.

All the clinical work involved in tracing alcohol history, assessing status by the Dip Profile

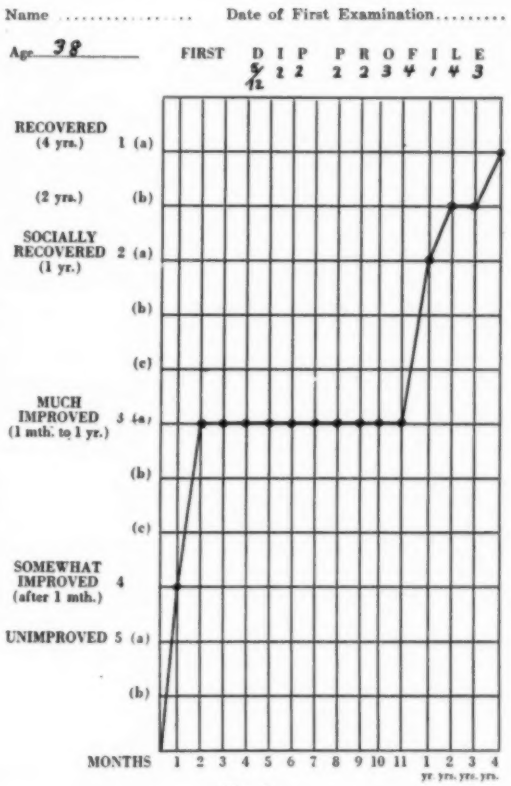
Name ..... Date of First Examination.....
Age 38
FIRST
D I P P R O F I L E
5 1 2 2 2 3 4 1 4 3
12
RECOVERED (4 yrs.) 1 (a)
(2 yrs.) (b)
SOCIALLY RECOVERED (1 yr.) 2 (a)
(b)
(c)
MUCH IMPROVED (1 mth. to 1 yr.) 3 (a)
(b)
(c)
SOMEWHAT IMPROVED (after 1 mth.) 4
UNIMPROVED 5 (a)
(b)
MONTHS 1 2 3 4 5 6 7 8 9 10 11 1 2 3 4
yr. yrs. yrs. yrs.

Fig. 2.
Recovery Scale for Dependent Drinking.

and plotting recovery, was deliberately planned to be used by nurses, social workers, and others who could relieve the physician of a great deal of work. The industrial nurses could quickly learn to use these graphs and profile. If considered workable in a particular Medical Department, the material on the three figures could be put into a simple folder and used for each alcoholic employee.

The misuse of sedatives in the treatment of alcohol addicts has become such a serious problem that it deserves separate mention. Alcohol addicts quickly pick up dependence on other chemicals in the anesthetic or narcotic group, particularly barbiturates and carbromal. New and still more serious metabolic changes can be quickly added to those already present in the alcohol addict. There is simply no safe place for barbiturate medication at any phase of the treatment for alcohol addiction. I refer you to the work of Isbell and Fraser[12] and to the opinions of Thimann,[13] and others.

In conclusion, I should mention that detailed treatment has been deliberately skimmed over, since in my opinion the industrial physician should not be expected to do more with alcoholic employees than he does with cardiac employees or others suffering from disease wherein etiology may be but slightly related to the in-

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dustrial situation. On the other hand, the alcoholic employee deserves as much understanding and care as the cardiac employee, and as yet this is far from being the case. The new role of hormones, multiple vitamin and mineral preparations, antabuse, etc., should be studied by the interested industrial physician, since they represent important treatment aids that could be carried out on ambulatory cases in a way that need not conflict with the other operations of an industrial Medical Department.

It is considered that the industrial physician has a unique opportunity to recognize dependent toxic drinking before it has reached the stage of alcoholic disease. No other group of physicians has this opportunity. If a little time is taken in routine examination of employees to inquire into and interpret drinking patterns, much unnecessary illness from alcohol might be prevented.

Finally, I wish to restate what was mentioned at the beginning of the paper. This is not a scientific treatise. Practically every clinical or pathological concept used in this paper should be considered open to question and should be clarified by further research. This is merely a suggested method of clinical orientation in a still confused area of medicine and psychiatry.

Before closing, I wish to express my sincere gratitude to PROFESSOR J. K. W. FERGUSON, Professor of Pharmacology at the University of Toronto, for his advice and criticism while this paper was being prepared.

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Security?

DURING the past winter, I was one of several who decided to take some time off and go fishing. At our vacation spot, one of us ran across a classmate whom he hadn't seen for about 35 years. This man was only 58, but he had retired on three-quarters pay as a Colonel three years previously, after more than 30 years of service in the army. Both my friend and the retired Colonel were graduated from one of the finest engineering schools in the world. My friend served throughout World War I and then went into business. Today he is an executive of a company which is a leader in its field. Back home from the trip, I received a letter from him, and I would like to quote from it a few words which epitomized his thoughts regarding his classmate, the Colonel: "I was appalled by the ravages of time. Please God, don't have me go through this stage of senescence. I don't mind growing old gracefully, being allowed some strength to resist, but as I think of poor old Jim, there was an example of complete frustration, lack of driving force, lack of everything consistent with the problems of today's living"....Now I want you to think of that. Here is a man who supposedly had all the benefits the book calls for. While he didn't become a General, he did rise to the rank of Colonel. After 30 years of service, he retired upon what I should call a good annuity. During the years of his service, he had available many privileges and perquisites not given to the man in industry. He had to jump through all the hoops and work out all the mazes the clinical psychologist set up for him. He received excellent hospital care and medical attention, and he can still get them whenever he wants them. And yet, at 58, my friend, his classmate, calls him a picture of utter frustration. I think I know why, and probably most of you do too. Let's put it this way: There is something more to this business of living than attaining power and prestige, and retiring after so many years of service with a comfortable pension. You figure out your own answer.

—From an Address, "Medical Considerations in Retirement Plans," by CARL T. OLSON, M.D., at a Meeting of the Industrial Relations Association of Wisconsin, Milwaukee, April 2, 1952.

Industrial Medical Practice–1952

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IN A YEAR which has seen under favorable circumstances the establishment of an American Board of Occupational Medicine, it seems appropriate that we consider objectively certain old and certain new features of industrial practice. Changing times, changing laws, changing attitudes, and changing technology have had a substantial impact on our special field of practice. The early battles have been fought and largely won. There may be an inclination to assume as a consequence that our framework of activity has been permanently crystalized. Industrial medicine, however, will always be a living, growing field because, of all fields of practice, it finds itself most immediately affected by medico-socio-technological progress. Thus, while principles may become crystalized, we should expect to develop and improve new methods and procedures while giving up that which is no longer useful. For the most part, I do not intend to discuss here specific clinical problems. Rather, I should like to view appraisingly certain aspects of the larger fabric of our practice.

Absenteeism and Non-Occupational Disability Laws

FOR MANY years medical control of absenteeism has been almost a slogan with us. We have pointed out the positive values of health maintenance and conservation effected through our usual techniques in controlling absenteeism. We have also emphasized to industry the dollars-and-cents value of such a feature of our practice. Unquestionably real savings in wages, production loss, and disability costs have been accomplished through these methods. We have been largely successful in this area because of several factors:

1. Through health education and personal contact we have had an unusually persuasive effect on the patient and on the attending physician of the patient. It seems superfluous to add that such persuasion has been primarily predicated on realistic clinical judgment of the situation at hand.

2. We have been successful in helping the patient realize that his career is to some extent dependent upon his own responsibility to maintain his health at a level consistent with the demands of his job and community life.

3. We have participated in and insisted upon the control of environmental hazards.

4. We have supported the concept of early and graded return to work, modifying work demands consistent with the degree of residual physical capacity—in a word, early rehabilitation in the full and modern connotation of the term.

5. We have recognized and dealt appropriately with the occasional malingerers, for the most part with the excellent cooperation of personal attending physicians.

We have accomplished these things because of our working relationships with the patients and our colleagues in private practice. There arises now, however, a measure designed to meet the economic need of workers disabled by illness of a non-occupational nature. Four states have a non-occupational disability statute on the books. In these areas a patient may have his illness attested by any physician and receive benefits accordingly, returning to work upon the decision of his personal physician. I mention this to emphasize the potentiality of this situation for the exaggeration of our well-known problem of the "slip from the doctor." The "slip from the doctor" we can often deal with on a personal basis with the doctor. The "slip to the state," as it were, introduces new complications. Under the Rhode Island law, there is no appeal mechanism to resolve honest difference of medical appraisal and opinion. Thus the community private practitioner will become the custodian of absentee control in state-covered workers, and upon him will fall the increasing responsibilty of critical judgment in authorizing disability benefits. Consequently, in this year 1952, let us not blindly overemphasize the nature of our contribution to industry in the continuing medical control of absenteeism. To maintain our effective leadership we should perhaps examine the problem critically. Non-occupational disability is now compensated in one of three ways:

1. A self-insurance program of the particular industry.

2. A group accident and sickness plan underwritten by a private insurance company.

3. A state non-occupational disability fund.

Where the first two plans are operative, our usual approach in the medical control of absenteeism is still applicable, though subject to certain new administrative complications. Under the third plan, the industrial physician will face many new problems. We must not naively believe that we can effectively contribute to the control of absenteeism under just any form of state non-occupational coverage. Where, as, for instance, in Rhode Island, there is no provision

Presented at the Thirty-Seventh Annual Meeting, INDUSTRIAL MEDICAL ASSOCIATION, Cincinnati, April 24, 1952.

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for resolution of cases disputed by the employer or industrial physician, the obstacle is apparent. New Jersey and New York, on the other hand, allow for examination by a third doctor if an employer or industrial physician disagrees with the findings of a claimant's attending physician. While theoretically this tempers the problem, the red-tape is apparent, as will be the problem of dealing with a different law in each state, particularly in those companies with operations scattered throughout the states. Unquestionably state non-occupational disability laws will increase in number for obvious reasons. Indeed, practically all states have had proposed non-occupational disability laws presented for committee or legislative consideration. State non-occupational disability laws will have a resounding impact in those industries which do not have medical service or private occupational disability plans. Possibly such an impact will have the effect of stimulating industry to initiate or implement old medical services. As industrial physicians, we have an obligation to familiarize ourselves with and advise our managements on the implications of existent and proposed non-occupational disability laws. The price of apathy will be reflected in the administrative difficulties that will come to roost in our departments and in the cost of our companies.

Diagnostic Services

RELATED also to the medical control of absenteeism is the matter of diagnostic services. Some believe diagnostic services to be a legitimate and essential component of industrial-medical service. Others believe them to be an intrusion upon the private practice of the community physician. Again, I believe we should be realistic. Without question in the matter of the usual periodic health examination, a case can be made for the restriction of certain aspects of laboratory work. Here I would mention specifically such items as gastro-intestinal and gall-bladder series, retrograde pyelography, extensive metabolic or neurological studies, and special cytological methods. However, as a natural consequence of performing a periodic health examination, we are obligated to appraise for the patient his physical condition. There are, therefore, certain features which must be included if we are to give him a good basic opinion. If we are to give only a partial opinion, I believe we should consider seriously the real value of our much emphasized complete periodic health examination. Thus I think it reasonable to consider that EKG's, for example, are now almost a basic part of our physical evaluation, as is also certain clinical laboratory work such as serology, hemoglobin determination, routine urinalysis, and chest films.

Furthermore, in the area of disability absenteeism, we are faced with problems that cost real money. If we are to function as physicians and not as clerks or lay claim examiners, we can not make intelligent decisions and reasonable authorizations for payment of disability claims unless we have appropriate facts at hand. Many such cases come to us with little or no positive data upon which a reasonable judgment can be made. If it is a matter of dispute between us, the patient, and the attending physician, we must have a factual basis upon which to take our stand. Thus in this area I believe it perfectly legitimate that the entire scope of diagnostic services without restriction, if economically justified in relation to our particular problems, be brought into play for the best management of disability claims. As a matter of fact, our hand will continue to be forced by the increasing costs attendant upon disability.

Alcoholism

DURING the last few years the problem of alcoholism has received an unprecedented amount of attention. Indeed, the concentrated activity currently directed toward this problem is phenomenal. We have, for example, the following agencies interested in developing programs or raising funds for services related to the alcoholic:

National Agencies:

The National Committee on Alcoholism (for information about alcoholism in general, and for assistance in organizing locally to carry out the fight against alcoholism).

Alcoholics Anonymous.

National States Conference on Alcoholism (for information regarding state programs on alcoholism).

Committee on Problems of Alcohol, National Research Council, Washington, D.C. (for scientific and medical information on alcoholism, for research, for evaluation of medical care and research programs).

Committee on Problem Drinking, of the Industrial Medical Association.

Federal Health Services.

Life and Casualty Insurance Companies.

Local Agencies:

Mental Hygiene Association.

State Mental Hospitals and their psychiatrists.

State Alcoholics Anonymous groups.

Local committees for education on alcoholism.

Salvation Army centers, many of which have special workers in this field.

Church committees.

University-Sponsored:

The Yale Center for Alcohol Studies.

Consultation Clinic for Alcoholism—University Hospital NYU-Bellevue Medical Center.

Industry-Sponsored:

Regional symposia and seminars.

Our own societies have in the past few years sponsored extensive discussions on the problem of alcoholism. One of the more interesting developments in the control of alcoholism is the approach to the alcoholic through industry. No

one will quarrel with the value of extending our case finding and preventive techniques to the alcoholic through appropriate measures in industry. It should be emphasized, however, that if we as medical men are going to lend our weight to the development of the concept of alcoholism as a disease, then it would be paradoxical and anomalous for us to sit by and see the techniques for management of this situation within industry develop without proper medical advice, or develop as ancillary services within departments and divisions completely divorced from medical activity. One cannot deal with a disease situation in industry without giving consideration to the patient-physician relationship, referrals to outside physicians, community facilities, adjudication of disability benefits, and maintenance of the proper confidential aspects of the situation. In these matters the industrial physician should lead and not be led. He should anticipate the techniques necessary for dealing with the alcoholic in industry. He should determine those aspects of it which fall in the disciplinary area and those aspects of it which are medical, and organize his program accordingly. He should acquire adequate information and know the necessary agencies which will help him in the management of the situation. Indeed, there is urgent compunction for all industrial physicians to give immediate attention to the manner in which they will handle the problems surrounding alcoholism. He should not let these duties go by default or by lack of perception to other well-meaning divisions or departments which, in coping with the problem, must inevitably impinge upon and complicate the medical activity. At the same time, recognizing that the majority of employed workers do not have access to organized medical services, the industrial physician should be alert to the opportunities for advisory service to the community and support of case finding and referral programs on a well-planned basis.

Mental Health

ONE MUST also look to the management of emotional problems and psychiatric cases. Here we have a group of cases which in various stages of their manifestations find their way into lay hands. Certainly we can cooperate with and appreciate the assistance of ancillary lay workers, but the pattern of case management must be basically medical. Again, we should lead and direct rather than tag along, and, in effect, function solely as an incidental tool in the control of the situation. Management has a tendency to look for short cuts to the solution of its human relations problems. Like the traditional short cut taken by the weary traveler, such methods create new rather than eliminate old problems. There is no short cut to mental health, nor can mental health be divorced from the total concept of health in the work or home environment, nor, indeed, can the industrial physician become a captive of his colleague, the psychiatrist, in directing and integrating such activity in its proper perspective in the industrial medical framework. The psychiatrist and the psychologist possess special knowledge and techniques and are anxious to apply them in industry. Just as we incorporate the talents of the cardiologist, the dermatologist, or the ophthalmologist, so should we be prompt to recognize the best that our psychiatric colleagues and psychological friends have to offer. It should be utilized, however, in the same integrated fashion in relation to our entire medical service as is any other special knowledge or technique.

Noise and Radiation Hazards

I MENTION, only in passing, the increasing importance of noise as an industrial hazard. This subject has been covered in extensive detail in the annual sessions of our special societies. Unquestionably, those of us who have such potential hazards recognize the significance of this matter and have taken the necessary steps to familiarize ourselves with the measuring and preventive techniques applicable to the problem.

Also, in passing, should be mentioned the increased exposure to radiation hazards in certain industries. Again, this subject has been discussed in comprehensive fashion. As industrial physicians, we recognize here an exaggeration of our old problem of radiation dating back to radium-dial painting. The basic industrial hygiene has long since been defined and placed in practice. Refinements have been largely a matter of degree and meticulous epidemiology in regard to new sources of exposure.

Research

WHILE we have developed over the years an extensive and significant literature on special clinical problems, there still is need for much basic non-occupational epidemiological appraisal in relation to employed groups. Though it has been emphasized before by eminent spokesmen, the matter can well stand repetition for there is yet all too little work in this field. Working with an adult group, concentrated, at least by record, in one place, we have every opportunity to study actual attack rates in the various categories of pathology. Inasmuch as most of this pathology is of a non-reportable nature, our industrial medical records constitute a primary and valuable mine of information. It is a reasonable assumption that industry as a whole represents a fair cross section of the community, even though we may get local concentrations of racial, ethnic, or economic groups. Thus it should be possible to obtain fair measurements of morbidity in several categories from our experience with the illnesses of our patients. Not only should such measurements be forthcoming, but correlation can also be made with the cost of such morbidity as we derive it from insured claim experience. It goes without saying that

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such basic studies are impossible without planned records. In several areas, however, records subject to the development of just this type of information are maintained or are contemplated. Here, it seems to me, lies one of the greatest challenges to industrial medicine. Here can be made a unique contribution to all medicine and our basic deposit of knowledge.

Education

UNDOUBTEDLY, one of the phenomena of the last 10 years has been the growth of educational facilities in industrial medicine. Among nine universities there are at present numerous opportunities for graduate training in the general field of occupational health. Indeed, the facilities are in excess of current student demand. Nevertheless, supply and demand will of necessity adjust and modify the situation according to the needs of industry and the student. The growth of academic facilities emphasizes the need for in-plant training facilities of a quality and nature represented by hospital residency for other specialties. This obviously must and will be a stimulus to both industry and industrial medicine. Such activity can have only a salutary effect on the whole field of practice, and places an academic head, as it were, on the body of industrial theory and practice.

Small Plants

STRIKING as it may seem, over 99% of the nation's employers maintain a roster of less than 500 employees, and in these plants are about 60% of industrial workers. Few of these workers have available any planned health services. While it is impossible for industrial physicians to cover this tremendous area, it is urgent for industrial physicians to recognize the scope of the problem and contribute to its solution. We all know that funds may be dissipated on fractional and part-time services which are poorly planned. Indeed, not only dissipated, but actual costs for such services may exceed many-fold the cost of well-planned part-time or group services. As a matter of fact, the group approach, whether on a centralized or circulating basis, offers a pattern to industry and medicine which cannot be ignored. There are now several groups of small plants operating successfully under the direction of an industrial physician. In our own communities we have an obligation to bring the value of group services for small plants to those actively interested. In this regard I should like to touch briefly on our place in the professional and civic life of our community.

Professional and Community Integration

WE HAVE long been accused of talking to ourselves, and rightfully so. We have more often than not tended to "hide our light under a bushel." More often than not we have, by circumstance or premeditation, separated ourselves from the stream of professional life. I think we all firmly believe that we are doctors first and foremost. As doctors we should cultivate and nurture our interprofessional relationships, not only on a social basis, but also on the professional level. Hospital, clinic, and teaching affiliations are as desirable and necessary for us as for our colleagues in private practice, in fact one might say more so. Post-graduate courses, hospital staff meetings, participation in the general scientific intercourse of our regional academies of medicine will all serve to enhance our professional acumen, and incidentally make us known personally to the men with whom we must all work, the community practitioners. Many of us benefit from scheduled hours which would allow opportunity for community service, either as members or advisers to the voluntary or official health agencies and the working committees of our professional societies. Specialty status notwithstanding, industrial medicine does not reach up to its full stature until, in a larger degree, it accepts responsibilities and gives of itself in the professional and civic life of the community.

Specialty Status

AFTER the years of solid endeavor which have led to its present status, one would wonder how much of an argument there is as to whether industrial medicine is a specialty. However, in this year of 1952 we find surprisingly, even in our own ranks, question as to whether the full-time practice of industrial medicine is a specialty. There are those who say it is not a specialty, that it is only the practice of medicine in industry. These people, to be consistent, should insist that surgery, neurology, or dermatology are not specialties, but only the practice of medicine for that part of the community with surgical, neurological or dermatological problems. It would seem that a physician exerting his full-time efforts in, and deriving his livelihood from, industry should be willing to stand up and be counted as an industrial physician. This, it would seem to me, is the more discerning course, rather than bowing to professional and social prejudices by insisting that he is a physician who just "happens" to practice medicine at the XYZ plant. Some will immediately take issue with this thought, feeling that it is an unfair indictment, pointing out that many full-time industrial physicians sincerely believe a specialty does not exist and that there is no difference between the practice of medicine in industry and in the community. Nevertheless, I submit that medicine in industry holds a unique position. It cannot put its theory, science, and art into practice in a vacuum. It is always in an intermediary position. It has the traditional responsibility to the patient, but it also has an administrative responsibility to management. Certain services are purely medical, others are administrative, some overlap. They must not be confused, and methods are necessary to dis-

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charge each responsibility equally without jeopardy to the other. It is no easy problem. However, it is just these methods, procedures, and special knowledge brought into play in the industrial environment that give medicine in industry its special character. I doubt if anyone here would care to defend the position that medicine could properly discharge its responsibility to patient, management, and community without a working knowledge and application of, for example, industrial hygiene, toxicology, epidemiology, and preventive, statistical, and administrative techniques peculiar to the field. It is not medicine alone which is required in industry, but medicine PLUS. It is the PLUS which distinguishes it as a special field, and without which medicine has little to offer industry.

Summary

IN SUMMARY then, in a decade measured from the shattering beginnings of a world conflict to a world effectively split in two, we have seen unusual growth and development in the field of medicine most closely related to the technological advances of that age.

With our basic concern still centered in the individual patient, we are challenged to adjust practice and procedures to the growth of the field. In this regard we have examined in a sort of potpourri those aspects of industrial practice which warrant notice and have reviewed briefly:

1. The advent of non-occupational disability laws and their import to medicine and industry.
2. Diagnostic services and their place in industrial practice.
3. Alcoholism—its implication in industry as a disease concept.
4. Mental health and its integrated relation to industrial health services.
5. Noise and radiation hazards.
6. Industrial medical research, particularly in relation to the epidemiology of non-occupational disease which constitutes the largest part of the industrial case load.
7. Education, its status and significance.
8. Medical services for small plants.
9. The status of industrial physicians in professional and civic life.
10. Industrial medicine as a specialty.

(763 Broad St., Newark, New Jersey.)

Too Old for What?

DR. CHARLES E. DUTCHESS rose before the Industrial Medical Association the other day to plead anew for the man who is forced by convention to retire at the age of 65, yet is able to do a full day's work. Though it had a familiar ring, his plea was worth hearing again; for the time is not far off when we shall have to consider the plight of the supposedly superannuated. As the years take their toll mental and physical powers wane, but it does not follow that at 65 a man is fit for nothing but life in an armchair. As medicine and surgery progress—and the pace of progress is almost bewilderingly fast—we may have to raise the age of retirement from 65 to perhaps 70 and even 75. According to the National Industrial Conference Board the number of persons 65 years and over will exceed 20 million by 1980. With machines displacing more and more men, and doing some thinking, we may also have to worry about giving youth its opportunity. Neither pensions nor social security can solve the social problem presented by the man or woman who is still active at 65 or 70. We do not look too closely at wrinkles and gray hairs when we are shorthanded in a world war. Dr. Dutchess makes the point that of the 11,000,000 added to our labor force in the last war 2,500,000 were over 45. We were even told that these older persons were steadier and less temperamental than their juniors in industry. Just what we are to do about old age is a puzzle. Some far-seeing industrial firms prepare workers in their early sixties for eventual retirement. The few programs so far carried into effect call for the cultivation of gainful hobbies or the creation of new departments in a factory or office where pressure is not high. It's a good beginning, but, as Dr. Dutchess sees it, the industrial physician will eventually have to teach employers "to stop being old-fashioned about old people." This means, in turn, that when a worker is considered "too old" we shall have to ask ourselves, "Too old for what?" —*New York Times*, April 27, 1952.

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Psychosomatic Principles of Nutritional Therapy

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THE science of nutrition has made outstanding progress since the beginning of the twentieth century. Nutrition has eradicated or possesses sufficient know-how to eradicate all the classical deficiency diseases prevalent in the first quarter of this century. Thus, rickets, infantile scurvy, and pellagra—all common diseases during that time—have essentially been eliminated. Beriberi and ariboflavinosis, which both paraded in this country under a variety of pseudonyms from about 1900 to 1925, are now, at the beginning of the century's third quarter, relatively rare diseases—thanks to a rising standard of living, health education, vitamin supplementation, and bread, flour, and corn enrichment. Facilities are available to prevent simple goiter and most nutritional anemia. Scientists have learned to measure and use intelligently two new vitamins, folic acid and vitamin B_{12}. These two normal constituents of protective foods are recognized by the medical profession the world over. Food and animal feed manufacturers include them among the most important items to be retained in or added to their products. Otherwise, anemia, nervous disorders, intestinal infections, poor growth, and other evidences of poor health result.

Parallel with this essential eradication of some classical deficiency disease syndromes have been the conspicuous improvements in maternal, infant, and child health and the virtual elimination as public health problems of many infections and contagious diseases—typhoid fever, infantile diarrhea, syphilis, and pneumococcus pneumonia. These are the larger major personal or public health problems. Even within the lifetime of many of us, it is probably safe to predict that tuberculosis will be eradicated as a public health problem. These advancements have made arteriosclerosis and its allied diseases our number one public health problem. Sixty million Americans now living will die of it. A new plague, although an old disease, has arisen to smite us. This fact must be met by drastic changes in the direction of increased acceptance of the newer knowledge of nutrition, no matter how untraditional and unconventional these changes may be. Diet plays an important role in the development and course of many chronic degenerative diseases. Although nutritional factors are not now known to play a direct part in the etiology of malignant neoplasms, it is known that the incidence of oral, gastric, vulvar, and liver malignant neoplasms are somewhat greater in those with chronic glossitis and chielosis, all of which are due at least in part to malnutrition. Also, life insurance records reveal that overweight people are more liable to cancer than those of normal weight. Hypertension is much commoner in those who are obese, and the incidence of cardiovascular renal disease is one and a half times as common in the obese as in persons of average weight.

The precise role of dietary cholesterol in the genesis and development of atherosclerosis is incompletely understood. The recent work of Gofman and his associates indicates a correlation involving a certain cholesterol fraction. The fats that are deposited in the arteries, liver and kidneys with the onset of hardening of the arteries are especially interesting. The worst offender is the familiar pattern of too many calories and too little of other essentials. The basic research on these complex fats has done more than to keep the medical profession fighting one of the most destructive diseases. It has an important role in stemming the wave of hysteria concerning a risk in eating meat and eggs. Not realizing that the body's fatal supply of the deposited fatty material, cholesterol, is chiefly dependent upon the total calories and fat eaten from any source, it was quite natural that many persons were mistakingly alarmed at the risk of consuming the small amounts found in common foods such as meat, milk, and eggs. As a matter of fact, there is much good evidence to show that normally an inadequate intake of the animal protein foods is one of the most important means of avoiding fatty livers and a great number of related injuries to health.

The first and almost the only record available of the human protein requirement in terms of each individual amino acid has been established, and has already guided an extensive amount of medical and food research. This basic datum in surgery, fractures, and infections, is especially timely in the light of new discoveries that show how quickly the body functions are distorted from their normal activity when good quality proteins are omitted from the diet. The disturbances are evident within one day, and severe within a few days.

It is now known that carbohydrates making up about 60% of the total calories, (the fats 20%, the proteins 15%) through recently discovered new pathways, are burned or converted to other body constituents. This knowledge includes both the normal conditions in men and in animals and also many disturbed conditions as in diabetes.

Presented at the Sixty-Fourth Annual Meeting of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, and the Annual Meeting of the ASSOCIATION OF SURGEONS OF THE PENNSYLVANIA RAILROAD, Chicago, April 3, 1952.

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At present one of the strongest trends in current nutrition is emphasis, based on clear-cut evidence, that both the essential and non-essential nutrients are in constant interplay within the body, and hence their quantitative requirements are interdependent. One must view the quality of the diet as a whole and avoid the extremes and unbalances that are so often encountered by getting excited about only one or a few vitamins or minerals.

It is obviously inconsistent to emphasize too greatly the role of only one or a few nutrients, such as a single mineral, sugar, protein or vitamin, or the nutrition of a single part of the body, such as the hair or skin, or to prescribe a combination of an unbalanced, and at times an unevaluated, group of synthetic vitamins for psychoneurotic symptoms instead of sedatives and further study.

NUTRITIONAL[1] therapy is predicated upon an understanding of biochemical and physiologic functions and psychologic principles. Many external and internal conditions are capable of altering nutritive balance both in health and in disease (Table I). Those conditions which increase nutritive supply to the body, i.e., higher income with subsequent ability to procure more protective foods, or those which decrease tissue requirement, as cessation of growth, generally have a favorable effect on body nutrition; those acting in the opposite direction, either decreasing the supply of nutrients or increasing the requirements, tend to bring about nutritive imbalance.[2] For example, in shock and severe diarrhea there is a 10 to 25% loss in the total potassium content of the liver.[3] A decreased supply to the blood serum results, thereby increasing the requirement for that mineral. Unless adequate potassium therapy is instituted as soon as urine output is assured, nutritive imbalance, manifested by neurologic, muscular, respiratory, and cardiovascular signs and symptoms, will occur.

TABLE I.
CONDITIONS INFLUENCING NUTRITIVE BALANCE[2]

External Environment	
Socio-economic:	Dietary:
Living conditions	Form of nutrient:
Working conditions	Provitamin: analogue
Available foods	Potential or intrinsic biologic activity
Ability to seek food	Level
Income	Imbalance—disproportion
Education	Interrelations:
Physical and Chemical:	Protein-carbohydrate-fat
Radiant energy:	Vitamin-vitamin
Light, infra-red	Vitamin-protein
Ultra-violet, x-ray	Vitamin-carbohydrate
Radioactive	Vitamin-fat
Temperature	Inhibitors—antagonists:
Mechanical:	Antivitamins
Trauma	Enzymatic destruction
Physical movement	Auto-oxidation-rancidity:
Pressure, irritation, friction	Oxidants-auto-oxidants
Occlusion	Processing of foods
Dentures	Availability of nutrients:
Toxicants	Precipitation:
	Phytic acid-iron
	Oxalic acid-calcium

Bodily Environment	
Digestive and Metabolic Channels	Functions and Reactions
Functional form of nutrient	Disease:
Ingestion	Degenerative
Digestion	Neoplastic
Absorption	Organic
Transport	Toxic
Formation of enzymes	Infectious
Breakdown of enzymes	Chemotherapy—Sulpha, etc.
Metabolism:	Endocrine relationship
Elaboration	Nutritional status:
Utilization	Morphology and physiology of tissue
Storage	Growth, pregnancy, lactation
Metabolic level	Work
Excretion	Psychobiology:
Biosynthesis:	Psychosomatic reactions:
Intestinal synthesis	Food habits:
Biodegradation:	(Socio-economic factors)
Intestinal destruction	Body constitution
	Hunger and appetite

In chronic nutritional deficiency, the type of nutritive imbalance most frequently encountered by the physician, symptoms, external stigmata, and tissue and blood pathology are not necessarily evident, owing to the lengthy period of time required for their appearance. Therefore, reliance on present-day laboratory and physical examination procedures and short-term dietary histories is not altogether feasible. In order to obtain a total picture of the patient's nutritional status, the number, type, and relativity of influence of all the various conditioning factors, both in past and present operation, should be evaluated. Clearly, the psychosomatic phase, under consideration here, constitutes only one spoke in the wheel of nutritive balance. However, it is frequently a significant determinant in the etiology of nutritional deficiency. Furthermore, it has important therapeutic connotations in every medical and surgical case.

Nutritional therapy should be designed to fit the specific psychosocial pattern of the patient along with the needs of his medical problem. In effect, this implies a knowledge of "food habits," the individual's motives for selecting and consuming certain portions of the available food supply. Food habits are determined in part by external environmental pressures, income, education, custom, etc., and in part by basic bodily constitutional and nutritional behavior (Table II).

Nutritional behavior, or the primary instinctual process of food intake, gives rise to psychologic representations. Since the intermediate phases of metabolism and utilization are entirely internal, they are not capable of such goal-directed reactions. With the onset of deprivation, the organism develops a synchronized tissue need. Animal experiments have shown that after various gland extirpations, dietary levels can be maintained through behavioral changes in the form of food cravings. In clinical experience this is evident also, as in the case of salt craving after partial or total destruction of the ardrenal cortex. In nutritive deprivation, tissue needs may be synchronized only after hours, days, or even weeks, owing to the large storage capacity for some nutrients and a long gap between intake

TABLE II.
FACTORS DETERMINING FOOD HABITS

External Environmental Influences	
Living conditions	Food Fashions—advertising
Working conditions	Food Fads—a social phenomenon
Income	Custom:
Education	(a) racial
Social strata	(b) national
Available foods:	(c) religious
(a) agriculture	(d) traditional
(b) technology—food processing	Food etiquette—preparation, service, and manner of eating food
(c) food distribution	
Scientific knowledge—nutrition education	

Internal Environmental Influences	
Hunger (physiologic) and appetite (psychologic):	Psychologic conditions:
(a) stimulation of sense organs	(a) inertia—fear of change
(b) influence of drugs—insulin, hormones, amphetamine sulfate	(b) emotional setting
	(c) memory association
Developmental pattern—infancy	(d) emotional condition—apathy, depression, elation, anxiety
(a) inherited emotional and possibly biochemical constitution	(e) food symbolism—security, power, prestige, friendship
(b) satisfaction of instinctive drives	Physical conditions:
(c) pleasure from the act of eating	(a) work and fatigue
Parental attitudes toward eating in childhood	(b) sexual excitement
Physical status, age, sex, intelligence	(c) growth, pregnancy, lactation
	(d) allergy and intolerance
	(e) disease

and output. Before actual tissue change occurs, however, a warning mechanism comes into operation. Through neuronal pathways this warning mechanism is related to anxiety, and it sets off psychologic patterns of instinctual behavior.[4] In body nutrition, hunger is the warning mechanism against tissue depletion, and appetite is the resultant psychologic response.

Hunger, an unselective phenomenon, and appetite, its selective psychic counterpart, have postulated centers in the brain through which the individual's eating practices are mediated.[5] Both may be influenced by various drugs[6] and through specific autonomic nervous activity.[7] Physiologically, appetite is expressed by means of the sense organs, through the appearance, temperature, odor, texture, and taste of food. The latter may not be an entity in itself, since recent work indicates that taste is a synthetic sense, a combination of touch and a trophic quality related to vibration, in which the tongue reacts to sweet, salt, sour, and bitter qualities.[8]

THE psychologic superstructure in relation to food intake is subject to many variations. The initial pattern is formed in infancy when psychophysiologic development is so closely allied with the eating process. The infant's first environmental, interpersonal relationship is between his mouth and the source of food supply, whether it be the breast or the bottle. Pleasure and satisfaction are derived from successful and adequate nursing. Sucking brings contentment, while hunger, eruption of teeth, and other lack of oral gratification produce discomfort and tension. Food and the mother are synonymous. She is the object toward whom feelings of love and hate are expressed. Thus patterns of emotional attachment can be set up around food. Adequate mothering or feeding supplies a sense of security, and the process of weaning can better be tolerated if consistent oral satisfactions have been experienced. If the infant is assured of his ability to obtain such gratification, the physical separateness from the mother does not present fearful prospects of isolation and abandonment, but encourages the child to new achievements and increasing mastery of his environment. In time the mouth takes on a new function, speech. However, in many adults, residues of the oral stage of development are retained, though in modified form. These include satisfaction from excessive eating, drinking, and smoking. A flexible attitude toward food usually results if the child has been encouraged to accept new foods. Rejecting or sidetracking them, due often to misguided parental education, may result in poor food habits and possibly in functional disorders, particularly those of the gastro-intestinal tract.

Distinctive features pertaining to food are present in other age groups. In adolescence, both boys and girls are socially sensitive and physically self-conscious. Compulsive eating is often used as compensation for inferiority feelings and lack of social acceptance. On the other hand, in the case of boys, fatness is particularly unwelcome since social recognition is sought through athletic achievements. With girls, fear of obesity is more closely connected with unattractiveness in terms of current cultural ideals. Eating problems at this period are accentuated by hypersensitive taste buds, in the cheeks and throat as well as in the tongue,[9] and diplomatic handling by the physician is essential.

Imitation of parental attitudes toward food and other childhood associations with food are frequently carried over into adult eating patterns.[10] Such expressions as "I dislike eggs" or "I hate milk" can usually be traced back to parental sources, either identification with or hostility toward one or both parents. The transition from a parasitic, egocentric, impulsive infant to a giving adult is not an easy one. Deep in the unconscious there are remnants of infantile resentment pertaining to early feeding experiences. For example, a husband's underestimation of his wife's household duties is usually concerned with food. The old wounds resulting from the hurts of complete nutritional dependence are still present subconsciously although they must be repressed in the conscious mind. One way to enforce this repression is outwardly to depreciate the person who provides food.

Food may be used to cajole, punish, deprive, or to establish a non-verbal means of communication.[12] It may be used to relieve anxiety. A person who is unable to accept his sexuality often expresses his anxiety by refusing food. In some instances, anorexia is similar in etiology

to the severe clinical syndrome of anorexia nervosa, in which the unattractive appearance resulting from a prolonged "hunger strike" protects the individual against social contact with the opposite sex. Here psychic rehabilitation takes precedence over nutritional and hormonal therapy. The patient should be helped to accept himself, including his sexual drives, and thus renew his appetite for life.

Nausea and vomiting may also be symbolic of rejection, a substitute method of denying one's psychic needs. For example, a 19 year old college boy was first seen complaining of anorexia and nausea when under nervous tension. These symptoms occurred when eating in a restaurant, traveling in a car or train, or visiting away from home. Subsequent study indicated that there was an infantile association of oral and genital areas. The oral fantasies were related to the mother with whom he identified. Thus there appeared a direct connection between subconscious fear of oral impregnation and inability to retain food when eating in public. The latter experience was filled with anxiety and fear of exposure centering around these oral fantasies, and the car-sickness and nausea in new environmental circumstances were also symbolic of inability to separate from the mother.

Food may stand for love and security. Probably 90% of obesity stems from compulsive alimentation serving as a defense against anxiety or serving as the easiest way to obtain immediate gratification. In most instances, passiveness and dependence have been created by a domineering parent, usually the mother, who, because she herself is unable to give her child affection and security, appeases his needs with the continual offering of food. For the child, eating becomes a weapon against anxiety due to insecurity and lack of love. Although many young men and women are outwardly concerned about marriage, they continue to remain fat because they are unconsciously afraid of the opposite sex. Likewise, when business and social contacts are associated with danger and insecurity, avoidance of these relationships is accomplished through acquisition of a large body size. In most cases the unconcerned, easy-going, jovial attitude of the fat person is but a thin veneer for underlying emotional stress.[13] A 49 year old salesman, an alcoholic, complained chiefly of obesity. In the history he stated that he was thin as a child, weight 154 at 19, but for the last 20 years had weighed over 200 pounds. His weight at the time of examination was 255 pounds. Rorschach study indicated that this man had almost completely inhibited aggressive drives. He appeared submissive and unable to be outwardly assertive in emotional relationships with others although he longed for such relationships. This apparently dated back to early childhood domination by the father. There were deep feelings of inadequacy, his own large stomach serving to identify himself with the pregnant female. This man showed great anxiety, emotional immaturity, and compulsiveness, all of which were reflected by his flight through food and alcohol. Special diets and weight-reducing procedures do not by themselves provide the ultimate therapeutic solutions in most instances.

Acceptance of the newer knowledge of nutrition is much needed in the everyday practice of medicine. It is every physician's challenge to interpret that knowledge in terms of the needs of the intelligence, emotional attitudes, and actual situation of the individual.

THE AIM of many of us is to know so much about a part of medicine that we will not have to spend time to have a long discussion with the patient. In considering the diet, we must keep in mind that no matter how much we know, e.g., about the gastro-intestinal tract, we must still invest time to learn about the patient who houses the tract; we must become thoroughly acquainted with him as a person, and learn his habits, his aims, his experiences, and his difficulties.

We can be reasonably certain about one thing in human beings—they will behave like themselves. When we undertake a series of procedures for a patient, we must recognize that the way he behaves is one of the ingredients which is added to our prescription. Treatment should be accompanied or often preceded by active psychotherapy.

The geriatric group is particularly prone to create dietary problems for the physician. It has been estimated that almost 10% of our population will be over 65 years of age by 1960, and that the greatest challenge for the physician in handling this group will be the host of chronic diseases to which the aged are subject.[14] This means that more emphasis should be placed on medical guidance and supervision in order to prolong the span of useful endeavor. Adequate diet is of particular significance in the successful management of degenerative diseases. However, in many individuals, food habits are rigidly and tenaciously retained. Suggestions for dietary change are resented, and consequently not accepted. Furthermore, there is a decline in structure and function of the taste buds,[9] which also contributes to the inflexibility of the geriatric eating pattern. Other obstacles pertaining to dietary change are consistent with the personality pattern of the individual.

In addition to certain trends in different age groups, there are significant psychosomatic aspects in the nutritional therapy of medical and surgical conditions. A few of these will be delineated. The deleterious effects of poor food habits on pregnant and lactating women are well-known. Many women do not meet the nutritional requirements for normal needs and do not appre-

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ciably change their eating practices during pregnancy, except perhaps for indulging in periodic food cravings. This is especially true in regard to protein and calcium intake.[15] The obstetrician can, through nutrition education and an understanding of food habits, motivate the patient to fulfill recommended dietary allowances, to drink one quart of milk daily, and to eat liver at least once a week, thereby enhancing the health of both mother and fetus.

Numerous accounts of peptic ulcer in recent literature attest to the significance of psychologic as well as nutritional therapy. In this psychosomatic disorder, the stomach or duodenum, via autonomic nervous system imbalance, vainly attempts to compensate physically for psychic anxieties. The syndrome develops from an unconscious dependent-independent conflict set up in early childhood when parental love has been inadequate or when self-expression has been suppressed in order to conform to overexacting parental standards.[16] Personality studies on three ulcer patients have revealed in each case a basic inferiority causing fear of sexual drives. Restrictions in this area had been present since childhood, and aggressiveness had been projected on an intellectual level. The gastrointestinal tract had become the target for the negative expression of libidinal drives. In many instances nutritional therapy itself serves a psychotherapeutic purpose. The frequent ingestion of milk and cream does more than neutralize free acid. It satisfies an emotional need for acceptance, milk being symbolic of mother. Similar to the environs of the hospital, treatment provides security and often results in rapid remission of the ulcer. However, upon discharge, and upon contact with previous environmental and personal relationships, symptoms may recur unless adequate help with emotional problems has been given. Surgery, principally vagotomy, although bringing about an apparent cure for the ulcer, does not insure gratification of the above needs, since a food regime becomes unnecessary. In view of the personality profile of the ulcer patient, perhaps the recent advice concerning the postoperative vagotomy patient is worth heeding—"Weaning should not be abrupt."[17]

The upper end of the gastro-intestinal tract may express conflicts concerning receptive trends. On the other hand, the lower portion is especially adapted to express holding and withholding tendencies in the individual. Chronic constipation is often a protest against the obligation to give. Similarly, if strong emotional values have remained attached to the intestinal tract in childhood and if the individual in later life is subjected to prolonged trauma, he may revert to the infantile anal phase of development with chronic diarrhea or some form of colitis.[18] Clearly, impaired nutritional status is evident. However, therapeutic procedures should include help with predisposing factors and, if possible, should bring about the elimination of attitudes responsible for the onset of distress.

PSYCHOTHERAPY along with dietary guidance has considerable prophylactic value for diabetic patients, since they tend to be anxious and indecisive. They may shy away from responsibility and demand attention from others. Some do this by making a member of the family measure out their food. Or they may get sympathy by stressing their deprivations. Often they blame environmental circumstances for their inadequacies, and seize upon their disease as an alibi for failure to assume responsibility or achieve success. Adjustment to a prescription diet may be difficult because it signifies further deprivation for an already emotionally deprived individual. Many patients are untruthful about adherence to their diets, although they try to gain favor by insisting that they never break them. Through a sustained physician-patient relationship, diabetic patients can be helped to accept the challenge of their illness, thus accommodating themselves to their changed internal functioning and following a recommended dietary regimen.

In many clinical disorders, myocardial insufficiency, hepatic disease, hyperthryroidism, tuberculosis, etc., poor appetite is frequently present. Parenteral supplements may be necessary in order to maintain nutritive balance. However, when possible, the patient should be encouraged to consume an optimal diet, since good food by mouth is the most effective form of therapy. Explanation and reassurance about the particular illness are simple but beneficial aids in alleviating anxiety and restoring desire for food.

Expert nutritional care is of paramount importance in surgery. Surgical procedures precipitate a nutritional assault on the body tissues which in itself, if not remedied, is productive of various mental and emotional symptoms. Apprehension, irritability, headache, and anorexia may be manifestations of vitamin B group deficiency, associated with failure to complete carbohydrate metabolism in the brain and resulting in anoxia. Anxiety relating to subconscious or conscious fears of death is usually present in the surgical patient, and appetite is often depressed as a consequence. Furthermore, the patient regresses to earlier behavior patterns of dependence, the doctor and nurse being the symbols of the authoritative parents. He resents his inability to assert himself, and forced fluids, feeding by the nurse, or unappetizing trays may contribute to his indifference to food. Appropriate interest in and cognizance of these factors by the physician would be of value in accelerating the surgical patient's physical and mental readjustment.

Nutritional therapy should not be used as a medical discipline. Supplements or a therapeutic diet are justifiably prescribed only in the

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event of nutritive imbalance. If used indiscriminately, they may serve to fixate existing symptoms. Adherence to a dietary regimen may fulfill the patient's need for self-punishment or may serve to explain away his shortcomings. Also, the physician may actually retard the patient's progress by keeping him on a diet when in some instances psychotherapy is indicated instead. If help with emotional problems has been given and the patient begins to feel his ability to assert himself, maintenance of a dietary regime may keep him dependent upon the physician at a time when he needs to break away. Frequently dietary instructions are so closely followed in every detail that, instead of making a simple substitute for an unavailable food item, the patient omits the type of food entirely from the menu. The physician should be aware that the patient does not establish a prolonged relationship with him, identifying him with authority, thereby obeying him indefinitely and prolonging the illness.

Many patients rebel against authority. They do not like to be told what to do. One of the most difficult problems for the physician is this type of person who fails to follow a prescribed regimen. Perhaps the ambulatory ulcer patient will develop a deep resentment, owing to the non-conformist attitude he feels he is obliged to assume before other people. At the same time, if the diet is violated, guilt feelings may come to the fore and precipitate the return of physical distress. Patients in all clinical groups, the cardiovascular patient in whom salt restriction is necessary, or the patient with cholecystitis who has to abstain from fried dishes and pastries, may also be unwilling to follow the prescribed diets, since such diets aggravate feelings of indifference from the group. Everyone assumes that he is an expert when it comes to eating, and dietary modifications are not easy to accept.

DIET therapy involves much more than issuing a printed list to fit the physical condition of the patient. This practice, however, is evidently subscribed to by many for, in a single year, physicians requested six million reducing diets from one pharmaceutical house alone.[19] Many of these are nutritionally inadequate. For instance, in the obesity diet, coffee is preferred to milk in all three daily meals, when actually it only stimulates the appetite, thereby working at cross-purposes to the objective of therapy. In addition, such diets obviously cannot fit specific socio-economic and psychologic needs. The fat person also believes that the omission of breakfast, the most important (and neglected) meal of the day, or a drug which curbs the appetite, will provide the magic weight-reducing effect he desires. Such measures may give temporary results, but unless the fundamental attitude is changed, lost weight will be regained as soon as he is faced with problems that challenge his low capacity for independent decisions and achievements.

Every illness has a psychic component, whether it be a situation in which neurosis is specifically related to a disorder or one in which anxiety and tension accompany an organic problem. In nutritional therapy, as well as medical and surgical procedures, the physician should be cognizant of this concept. An individualized, dynamic approach recognizes the personal identity of each patient and the fact that his nutritive needs should be correlated with his psychological pattern.

An integrated therapeutic program is initiated in the physician's first contact with the patient through mutual understanding and rapport. It is important to assess the type of help the patient is willing to receive, and to grasp the personal forces manifest in the clinical phenomena. In the first interview the physician may profitably utilize simple conversational techniques for ventilation of the patient's difficulties and reactions toward his illness. Vital personal issues should generally be omitted, in order to avoid the possibility of protective rigidity and antagonism. A frank explanation of the patient's nutritional and medical problems and prognosis, based on a thorough physical examination and indicated tests, should be forthcoming. This should be done in understandable language and at the same time in such a way that he will not be ashamed of its implications. If temporary or permanent dietary modification is indicated, the patient may be helped to feel his own responsibility in getting well. Psychotherapy in the form of reassurance, suggestion, rational explanation and education may serve to motivate him to accept the challenge of dietary change. In many instances, however, this type of symptomatic psychotherapy should be accompanied by therapy directed toward re-synthesis of the patient's personality structure. Through weekly conferences and interviews with relatives a more detailed appraisal of his personality, psychic make-up and environmental situation may be obtained and a dynamic physician-patient relationship established. The acquisition of special techniques such as the palmar sweat test,[20] a weekly food questionnaire, and an autobiography including past and present food habits, may be of additional help in realizing rehabilitational goals.

The objective of nutritional therapy is to attain or maintain nutritive balance. In addition to the application of newer nutritional principles, due consideration of individual nutritional behavior, as constitutionally defined and modified in all periods of health and disease, may beneficially supplement preventive and therapeutic recommendations in clinical practice.

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Scope of Medical Services

FROM time to time an appraisal is essential for good administration of health services in industry. A concise guide is presented here to indicate in principle the trend of the scope of health services in Canadian industry. It is recognized that these principles should be adapted to meet the needs of the particular industry by the medical staff supervising the services. They have been listed below in broad outline because of the many requests for this information. The scope includes: *Emergency care:* (1) Early and efficient care for occupational accidents and illnesses. Under the provincial workmen's compensation acts disabled persons have some freedom in choosing their own physician. (2) Emergency care for non-occupational accidents and illnesses. For further treatment patients are referred to their own physicians. *Health examinations:* Pre-placement and periodic examinations with active participation in programs for vocational guidance and rehabilitation. *Supervision of the occupational environment:* This includes potential occupational hazards, safety programs, plant sanitation, nutrition, and other facilities associated with health. This will necessitate close co-operation with others who share responsibility and interest in the matter. *Health education and counselling:* (1) Education: health education, nutrition, management of illness, etc. (2) Counselling: assisting employees in their process of adjustment for greater efficiency and happiness in work; also to counsel the worried worker, accident-prone personality, and those with problems of adjustment to fellow workers and work patterns. Personnel and industrial relations. (3) Group teaching—usually to be developed in an industrial health service. Employee participation is essential to success. *Record System:* Adequate simple records are essential for any industrial health service. Records are required for compensation purposes and the assessment of tangible and intangible benefits to be derived from the medical service. *Home visiting* by nursing personnel based on well defined objectives, these to be reviewed periodically in relation to the total health service.

—From *Industrial Health Review* (3:1, December, 1951), published by Industrial Health Division, Department of National Health and Welfare, Ottawa, Canada.

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The Industrial Physician and the Workers' Home Problems

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DURING the past four or five years, we have been interviewing employees who have questions to ask concerning their families. The questions, in general, are simple and not difficult to answer. They fall into two groups, those which concern the worker and his wife, and those which affect his children. The first group is more or less miscellaneous, while the second follows an even pattern. About three-fourths of the questions fall into this latter group.

ALTHOUGH only about one-fourth of the questions are included in the first group, I consider it extremely important. The worker is in earnest when he asks for a word in private with the plant physician. Most of the inquiries will be familiar to you. I mention them only to voice a plea that the worker be given enough time to tell what is troubling him. Here are a few:

1. I had a hernia operation two months ago. Why has my sex power failed since the operation?
2. I have been having abdominal cramps since my wife became pregnant. Is that natural?
3. My wife has to have a tumor removed from the uterus? Can we have children after that?
4. We live on the third floor. My wife is pregnant and has to go up and down three flights of stairs to go out. She says she'll get a divorce if we don't move. She is always complaining. What should I do?
5. My husband often comes home drunk on payday. Sometimes he stays out all night. Will you please talk to him.
6. I think my husband is going around with other women. What should I do?
7. My husband is melancholy and depressed. What do you think is wrong?
8. My voice has been husky for over a month. Could it be cancer?
9. I sent my family to California a year ago because of a scandal. Do you think I could bring them back now?
10. I married a girl 25 years younger than myself. She wears me out going places. I'm afraid she will leave me. What can I do?
11. My only daughter was killed in an accident. I thought about it in the mill one day and I fainted. What do you advise?
12. My wife has cancer. Sometimes I can't do my job because I feel sick when I think about her. What do you advise?

IT IS interesting to note that most employees who ask for a private talk with the plant physician do not wish to discuss disease processes, except for some inquiries concerning operative procedures and cancer. This holds true also for the questions sometimes asked by wives of the employees in phone interviews. The industrial physician, therefore, finds himself in the unique position of being privileged to minister to the most intimate secrets of the workers' family life. He must bear in mind that parents are often just grown-up children; some of them mature, but others woefully immature. Like children, these parents need continued security and reassurance for a normal family life.

The first question will be discussed briefly, with some comments on the others. Impotence is a great source of worry to many employees, not only after hernia operations, but also following injuries to the genital organs or other parts of the body, after illnesses, and after emotional upsets. It is psychogenic in most cases, but all patients should have a thorough physical examination for organic disease. Patients asking for advice vary in age from young to old. The oldest of our cases was 75 years of age. He asked a number of questions about hormones. A problem of this type calls for a great deal of tactful and thoughtful consideration. These old men should not be "brushed off" with the remark, "All you need is a pension."

The most recent case I interviewed was that of a 27 year old man who was operated for an inguinal hernia a few months previously. He stated that he had been impotent ever since the surgery. His wife continually accused him of flirtations and intimacies with other women. She threatened divorce. I asked him to have a thorough physical examination and then return to see me. He came back within a few days with a note from his family physician who stated that he found the man in good physical condition and advised only iron and vitamins. I assured him that he would improve within a short time. Two weeks later he told me that he and his wife had solved their difficulties.

Not all cases are as simple as this one, but the plant physician can do a great deal to reassure these younger patients who have minor injuries or operations.

Question 4 is rather stimulating, because it calls attention to the effect of environment on mental health. The young man who came to see me was a veteran of World War II. He told me that his wife had been much dissatisfied with their living conditions even before she became pregnant. Since the pregnancy her complaints were so frequent that he felt that something had to be done quickly, or his nerves would "crack." At that time living quarters for rent

Presented at the Thirty-Seventh Annual Meeting, INDUSTRIAL MEDICAL ASSOCIATION, Cincinnati, April 24, 1952.

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in the Pittsburgh area were difficult, if not impossible, to find. He told me that he had saved $2,000, and had been thinking of buying a small house but was afraid of the high prices. I consulted several reliable real estate brokers about the local housing situation and sent word to the man to see me again. He was advised to buy a home because the trend in prices was definitely upward, and it was expected to continue in that manner for an indefinite time. He did not return after the second interview, although we were quite anxious to hear from him.

Good or bad environment not only affects the emotional life of parents, but it also has a direct influence on the proper growth, development and behavior of the children.

IN GROUP II, I shall discuss some of the less complex deviations from the normal in the behavior of children. It is in this group that most interest is shown by the workers. Following are some of the questions:

1. Why doesn't my child eat?
2. Why does my child have nightmares?
3. Why does he wet the bed when he is over five years old?
4. Why is he so thin and nervous?
5. Why doesn't he want to play with other children?
6. Why does my baby bang his head against the wall or sides of his crib?
7. Why does my young daughter bite her fingernails?
8. Why did my 13 year old daughter suddenly refuse to attend school?
9. Why is my young son such a poor reader?
10. Why is my child failing in school?
11. Why does my six year old son stammer since he started to go to school?
12. Why does he vomit each morning before he starts to school?

Since many of these questions are indications or clues to similar situations, it is expedient to discuss two common problems. In this way, I believe most of the questions can be answered.

Failure of their children in school work is the No. 1 worry of many parents. "Why is my child failing in school?" The industrial physician will be asked this question many times if he shows an interest in the mental health of the workers in his organization.

Sometimes the solution is simple. One interview may be enough, but often more time is necessary. A full history is impossible with this type of set-up, because of the time factor. If the short history outlined to the industrial physician indicates a complex condition, the patient must be referred to a guidance clinic for a full work-up.

School failures are frequently due to emotional upsets, but not always. One must bear in mind that organic disease, often minor in nature, will eventually lead to failures if not discovered early. Modern teachers have been alerted to this situation, but some of the less pronounced cases are missed, by the teacher and the school physician.

Minor errors of refraction are common. Sometimes a child will pass all the usual visual tests and say that he can see very well. However, he may have slight astigmatism which shows its affects only when he becomes fatigued. Far-sightedness may be missed. A student may be able to accommodate for the short time necessary to read a chart 20 feet away, but he becomes irritable and cannot concentrate for long periods. If a child is color blind, some confusion may result if much colored material is used.

Sometimes children suffer from inattention deafness. They hear well ordinarily, and may pass the usual hearing tests. But under the influence of excitement, fear of the teacher, or intense concentration, these same children cannot hear properly. They may be accused of laziness or lack of concentration. This is an actual condition and is not malingering in any sense.

In contrast to the deafness caused by mental stress, there is an organic condition called "high-frequency deafness." This results in poor work and often in poor speech. The child's ears do not appreciate the difference in the higher pitched overtones of letters like "s," "f," "th." Vowels are often not heard properly. Because the overtones of various sounds in speech are not heard properly, they are not spoken properly. This can cause speech defects and poor understanding. Lipreading may result.

Tinnitus is another affection of hearing which is a constant source of annoyance to the child. It may cause him to be irritable without apparent cause, and may result in poor concentration.

In addition to the visual and hearing disabilities, there is another rather fascinating condition which is sometimes called "crossed-laterality." It is not uncommon if the physician is on the watch for it. Crossed-laterality is the dominance of one hand and the opposite eye. Normally, either one side of the body or the other is dominant, the average person being right-handed, right-legged and right-eyed, although other combinations do occur. Crossed dominance is frequently associated with difficulties in reading, writing, spelling and speaking (stuttering). The language function disabilities are usually first noticed when the child begins to read and write. He may start on the right side of the page and work to the left. Mirror writing is common, and such letters as "d" and "b" and "p" and "q" may be formed backwards. Others may be written upside down. Later, when the child is writing sentences, he may omit words or transpose letters and syllables in words. "Was" and "saw", "on" and "no," are frequently reversed. An example of the difficulty with "b" and "d" is the word "rabbit." It is often written as "raddit." Sadder still, the youngster does not recognize his mistakes and cannot correct them. This condition makes for slow, inaccurate reading with a tendency to skim quickly over the page. There is little attention to detail such

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as one finds later in the study of English, foreign languages, or history. Spelling is poor because of the difficulty in forming letters and words correctly, and even very simple words are misspelled. Writing is slower than normal, and sometimes it is illegible.

These children are not stupid. Many are highly intelligent and are excellent observers. In mathematics, drawing, laboratory work in the sciences and other subjects where normally fast reading is not required, they often excel. Although the difficulty will frequently clear up by the time the child reaches the sixth grade, he will be behind in school because he was unable properly to learn the fundamental rules at the time they were being taught.

Stammering may result from this condition in some cases. Some investigators believe that attempting to change left-handedness to right-handedness may precipitate stammering. Some stammerers are fearful and anxious children, and stammer because of embarrassment.

Aside from the special educational disabilities just described, emotional factors of many kinds cause failure in school. Indeed, emotional disturbances and personality changes are often the result of these difficulties. Some of the emotional factors involved are various types of fears. Fears may cause the child to vomit his breakfast every morning, may cause headaches and fainting spells, or even cause him to miss school often enough to do poor work. He may dislike his teacher, or some of his fellow students who tease him for various reasons. Parents who are too ambitious for their children may make unfavorable comparisons and so upset the child. Eventually, as the mental stress interferes with concentration, understanding and remembering, the student's work will suffer.

THE SECOND condition which I wish to discuss is closely related to the reasons for school failure I have just outlined, but it can be studied more easily as an entity. I refer to the questions concerning nervousness and anxiety in children. Parents are much concerned about this problem, but in most cases are not aware that they themselves are sometimes at fault. A word of warning should be given at this point. It is well to be extremely tactful about explaining to parents that they are the probable cause of their child's troubles. Most parent workers become antagonistic if their shortcomings are detailed too abruptly. It is difficult for them to understand that emotional states easily pass from parent to child. Someone has said that "There is nothing more contagious than fear."

Most so-called nervous children have a tendency to be poorly nourished, to have poor posture and color, and to have tics and tremors. Nail biting, enuresis, bad dreams, night terrors, poor handwriting and failure in games are often present.

These children are fearful and over-anxious and are too dependent on one or both parents. They cannot break away from the parents and lead a normal life. The parents as a rule, are fearful and nervous, either because of personal problems or because of a similar condition in their own parents when they were growing up. Such parents tend to aggravate the child's fears by disagreements. Bickering at mealtime spoils the child's appetite and he loses weight, or he may vomit his meals. This, in turn, worries the parents and then the emotional cycle is established.

So much tension can be built up in a situation of this type that anxiety states in both parent and child can result. Fears of what might happen cause physical reactions such as dilated pupils, tense muscles, fast heart beat, and flushing of the skin. Fear of the dark, fear of death, fear of animals, and fear of other children is common. Obsessions may intervene, or the child may be hard to manage. Adopted children who have not been told the true story of their parentage often become unmanageable. The "hard to control" child is in a state of conflict or misunderstanding with an adult. Truancy and other forms of delinquency may result.

NOW about a few cases which exemplify most of the symptoms given, and then a word on treatment of the general problem.

Jimmie was a healthy looking boy of eight years. He had been promoted to third grade but kept gradually falling behind in his school work. In the first and second grades, his work had been quite satisfactory, but the third grade teacher reported that after a month or two in her grade he was apparently not interested in his work. He often became irritable and inattentive, especially in the afternoons. At times he created disturbances with other students, and once or twice he fell asleep in class. Examination by the school physician and by his family doctor revealed no physical abnormalities. The usual visual and hearing tests were normal. The intelligence quotient was above normal. But the poor school work continued. After a few months, the family physician advised the parents to take Jimmie to an oculist because of frequent headaches. Refraction revealed far-sightedness which was soon corrected by the proper lenses. Jimmie changed rapidly from a lazy, irritable student to the alert good-natured boy that he really was.

Margie was a thin little girl of 10 years. She was an only child, and had a tendency to be "picky" with her food. She had nocturnal enuresis until the age of five years. During these first five years she often cried out or screamed in her sleep. She seemed afraid to go out alone and, until the age of seven, her mother always walked to school with her. The physical examination continued to be essentially negative, but new symptoms appeared between the ages of nine and 10 years. She began to lose some weight, and her mother forced her to eat more at break-

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fast time. Vomiting of the morning meal was the inevitable result. Then Margie began "slipping" a little in her school work because the attacks of nausea frequently forced her to miss classes. A short history revealed that the parents themselves were highly nervous. There was constant bickering at mealtime and often the quarrels were climaxed by the father leaving the table and rushing out of the house. The mother frequently threatened divorce in the presence of the child. Through the years Margie gradually developed the insecure feelings which were responsible for the changes in her personality and behavior. She thought she was going to lose one or both parents, so she compensated by becoming too dependent on them. Since she had no brothers or sisters to help her, her parents constituted her whole world.

Ruth had been a well adjusted girl until she was 13 years of age. She suddenly decided that she couldn't go to school any longer, although her class work was excellent. Her parents begged her to reconsider, but she would not. Her father told me that her only reason was that several boys continually teased her and called her vile names. One boy struck her and often pushed her when he had a chance. Physical examination was negative except for a mild facial acne. The family physician reported all laboratory tests negative. Hearing, vision, and I.Q. were normal. Children with acne often have insecure feelings. This is true of both girls and boys. Ruth imagined that she was unattractive to her classmates, especially to boys. When it was explained to her that boys of her age do not like to admit that they are interested in girls, and that they sometimes adopt roundabout ways to gain feminine attention, she attended school the next day. Later, her father reported that his daughter was happy and getting along well with her school work.

IN SUMMING UP, I think it is safe to say that the majority of behavior and personality problems can be solved by making the parents aware of the difficulty. Sometimes in a very short interview, the industrial physician can relieve the worker of a heavy burden. The best treatment is more security for the child, more affection, and something to keep him busy. Many parents fail to realize that the growing child needs a firm, but gentle, guiding hand. The youngster trusts and admires his parents. They are the most important people in the world to him. If he can lean on them, nothing can harm him.

But he wants something more. He craves some outward expression of the parents' fondness for him. He likes to be praised, and he wants to be fondled and caressed, especially in the earlier years. The cold attitude of some parents is a mistake. And last, but very important, he wants to be kept busy with useful play or work. Built-up energy must be expended some way.

I shall not attempt to outline play and work for the various ages from childhood to adolescence. But I do wish to emphasize a "must" in all types of useful occupation for children. Parents should see that any task which the child is doing must be done well. Misdirected energy resulting in incomplete work, or drifting from one task to another is the worst possible training for the child.

If the personality or behavior problem is severe as a result of poor school work, or if the reverse condition exists, every effort must be made to fill in the educational defects before much can be done with the emotional condition. If the child does well in drawing or painting, or in music, advantage must be taken of his best work, whatever it is, so that it can be built up into something in which he excels. In this way, confidence is restored and gradually spreads to his more difficult subjects.

It is to be noted that where the educational loss is extensive and the emotional upset severe, remedial guidance at a clinic must be sought.

Another "must" in this type of treatment is to insist that parents establish definite routines for their children. Regularity begins with training in infancy. The early training in nearly all of the behavior cases has been neglected, so it is important to establish some type of routine in guidance cases in order to make up for the lack of it. Regular food, regular sleep, regular daily work and an awareness of the rights of others are essentials in a well-rounded program.

IN CONCLUSION, I wish to add that we feel that through the medium of short interviews, through monthly items on health education in our plant magazine, and through the various publications and talks by the personnel department, we can make a definite contribution to the mental health of our workers.

And what can I say to encourage the industrial physician to try such a plan? Every plant physician, as he goes on his endless routine of dispensary treatments, must realize that he is not using all of his talents. How many have wished for an outlet for this stored-up energy! The program I have outlined is a challenge to such men. The problems of the parents and their children reach far into the future. The children of today are the workers of tomorrow.

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ACTH (Corticotropin) in Industrial Medicine

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IN THE two years that ACTHAR* has been generally available, it has been repeatedly demonstrated that this agent can be used with safety in a wide variety of conditions and that its administration is relatively easy.[1] In considering therapy with ACTH, one is impressed with the practical aspects of management, such as how to prevent and control so-called "side effects," how to evaluate the therapeutic response, what contra-indications exist, and the principles of treatment. In reviewing the indications, one is further impressed with the fact that no branch of medicine is excluded—there exist a number of conditions which respond to treatment that are as common to industrial medicine as there are conditions common to any other specialty, or for that matter to the general practice of medicine.

General Concepts

FOLLOWING the work of Thomas Addison some hundred years ago, from more or less continuous research two basic concepts have evolved:

1. The adrenal cortex is necessary to life, and
2. The adrenal cortex is vitally dependent upon the anterior pituitary for its normal function activity.

ACTH (Corticotropin) is the natural hormone secreted by the pituitary gland, and functions as the true physiological stimulus to the adrenal cortex. Thus, it alone is capable of stimulating the adrenal cortex to produce and secrete all of its steroids. Cortisone and Compound F represent only a few of the adrenal cortical steroids secreted. These steroids are of three general types: (1) Sugar hormones—capable of mobilizing energy sources (glucose, fat and protein) and restoring energy in the form of glycogen. Also these steroids have some effect on electrolytes and water retention and exhibit an androgenic effect. (2) Salt hormones—these play a regulatory role in the retention of sodium and chloride and the excretion of potassium. (3) Protein hormones—so called because they stimulate protein synthesis and prevent protein breakdown, they antagonize the catabolic effects of Compound F. These steroids may induce a positive nitrogen balance and increase protein in contrast to Compound F, which may produce a negative nitrogen balance.[2]

The therapeutic efficacy of ACTH derives from the fact that it stimulates secretion of all three types of cortical hormones, all of which are of particular importance in the face of stress situations.

When ACTH is administered, endogenous secretion of ACTH may decrease somewhat, particularly at higher dosages, but returns to the pre-treatment level when ACTH therapy is discontinued. When cortisone is administered, there occurs not only a decreased secretion of pituitary ACTH but also a depression of all the adrenal cortical secretions.

It is apparent from the foregoing that important differences exist between ACTH and cortisone. ACTH is stimulation therapy and its effect is to stimulate the adrenal cortex to secrete and produce all of its hormones. Cortisone, on the other hand, is substitution therapy and its administration renders the patient dependent upon a single adrenal cortical steroid compound. Thus on cortisone therapy, the adrenal cortex tends to become constantly less active as therapy continues, to the point that adrenal cortical involution or atrophy may occur.

The mechanism of action of the adrenal cortical steroids is not yet definitely established, although it is most likely that they interpose a block between toxins and tissues at the cell levels. Thus, cells are protected against injurious agents. It has been postulated that this "antitoxic" effect may occur: (1) by destruction or adsorption of the toxin, similar to the way diphtheria antitoxin neutralizes diphtheria toxin; or (2) that the antitoxic effect is exerted at the cell membrane level, preventing entrance of toxins; or (3) the toxin is prevented from disturbing the normal mechanics within the cell itself.[3]

Safety of ACTH Therapy

THROUGH the efforts of the pioneer manufacturer of ACTH, a set of principles were developed which made administration of the drug particularly safe. When the recommended administrative procedures are followed, so-called "side effects" are virtually non-existent. At any time, should they occur, they can hardly be considered as "toxic" effects. Certainly they are not toxic in the same sense as are the toxic symptoms following over-digitalization or the toxic reactions from the use of gold or sulfonamides.

As is true with insulin or thyroid, ACTH can alter many physiologic processes when used in excessive doses. The signs and symptoms which may be observed when ACTH is given in over-dosage are really physiological signs of adrenal cortical over-stimulation. The safety of ACTH therapy is reflected from the fact that the over-dosage effects appear gradually and permit ample opportunity for dosage adjust-

*The Armour Laboratories brand of ACTH (Corticotropin).

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ments to prevent progression; furthermore, in all instances the manifestations of over-dosage are reversible with regression to normal as the dosage is decreased or therapy is discontinued. ACTH is quick-acting and is quickly metabolized —thus no cumulative effects develop when the dose is properly selected and the interval between injections is properly spaced.

Evaluation of ACTH Therapy

TREATMENT with ACTH is not difficult and requires no special medical training or laboratory detail. Because ACTH therapy is stimulation therapy, results may appear within a few hours after administration, changing the signs and symptoms of the disease. These very changes serve as an early guide for estimating the adequacy of the dosage. Changes which are not clinically apparent can be readily determined by simple laboratory procedures. The criteria for evaluating response are:

A. CLINICAL CRITERIA:

1. Depression of fever. In a disease associated with fever, the fever tends to return to normal within four to eighteen hours on adequate dosage. Return of fever on a decreased dosage schedule suggests that the dosage is inadequate.

2. Inhibition of pain. When pain is a symptom of the disease under treatment, its disappearance is an index of beginning improvement. Reappearance of the pain suggests that the dosage should be increased.

3. Improved sense of well-being. This quickly occurs in most patients receiving ACTH and this cannot be accounted for entirely by the relief of pain and discomfort.

4. Improved appetite. Virtually all patients experience a decided improvement of appetite. This may become so striking that the dietary intake must be considerably increased.

5. Inhibition of inflammatory reaction and swelling. Joint swelling, such as occurs in rheumatoid arthritis or acute rheumatic fever, may completely disappear within a short time. Dramatic improvement of mobility in a few days may be observed due to a decrease in joint swelling and to a reduction in muscle stiffness and pain.

B. LABORATORY CRITERIA:

1. Eosinophils. Reduction of the eosinophil count in the peripheral blood (Thorn or Four-Hour Test) is a most sensitive practical indication of adrenal cortical stimulation and may be useful as a guide to dosage and effectiveness. This test is easily performed.

2. Erythrocytes. In diseases associated with anemia, ACTH therapy tends to elicit a reticulocytosis, followed by return to normal of the red blood count. While it corrects such secondary anemias, ACTH therapy will not increase an originally normal red cell count.

3. Sedimentation rate. An elevated sedimentation rate tends to return to normal values under ACTH therapy.

4. 17-Ketosteroids. Urinary excretion of 17-ketosteroids closely parallels the extent of adrenal cortical stimulation under ACTH administration. Determination of these steroids is not necessary from a practical viewpoint.

General Principles of Treatment

THE AIM in ACTH therapy is to obtain the maximal therapeutic result with a minimal dosage and to avoid over-dosage effects. The earlier treatment is started after the onset of the disease, the greater are the chances of success. Chronicity imposes the use of larger doses over prolonged periods of time, makes for slower appearance of therapeutic effects, and reduces the completeness of recovery.

An adequate dosage regimen is worked out in two consecutive stages: (1) The initial period, until the effective dosage is established and the desired clinical improvement has occurred. (2) The tapering of dosage, terminating either with complete withdrawal of therapy or with determination of the smallest effective maintenance dose in those diseases requiring prolonged medication.

ACTH or any of the adrenal corticoids, such as cortisone, may produce side actions directly related to their physiological influence upon metabolism and hormonal equilibrium. Although these effects seldom are a problem, should they occur, they are readily reversed by lowering the dosage or discontinuing therapy. These effects are as follows:

1. Edema formation. This is evidenced by an unusual weight gain and by the clinical evidence of edema. It is caused by the retention of sodium, chloride and water. Edema formation is controlled by placing the patient on a low sodium chloride intake, moderate fluid restriction and, if necessary, mercurial diuretics. Should edema still persist, omission of a few doses will invariably cause a spontaneous diuresis. Edema is seldom a problem on lower dosage schedules.

2. Glycosuria, Hypoglycemia. This is caused by a too-rapid and excessive mobilization of energy sources from the three basic nutrients—protein, fat and carbohydrate. It is controlled by decreasing the dosage, omitting a few doses, or discontinuing therapy. Insulin may be given if indicated and diabetics may require an increase in insulin requirements.

3. Hypertension. This is caused by retention of sodium chloride and fluids or by previous vascular pathology. It is controlled by the measures indicated under control of edema; if, however, the hypertension persists or is severe, discontinue the dosage. Increased blood pressure may be transitory during the period of salt and water retention; moderate hypertension rarely presents a problem. It is advisable to check the blood pressure daily during the early days of therapy but thereafter only every one or two weeks.

4. Muscle weakness, Fatigue, Paresthesias.

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These are due to an increased urinary excretion of potassium and may be readily detected by alterations of the EKG (T-Wave). Determination of blood potassium levels are rarely required since the electrocardiogram is a very reliable test for low potassium levels. These effects are controlled and even prevented by the concurrent administration of potassium chloride or acetate orally, to to five Gm. daily. These effects are not common even on high therapeutic doses.

5. Nitrogen Loss. This is caused by an increased protein catabolism and is controlled by a high protein diet (100 Gm. of protein or more daily).

6. Psychic Disturbances. Such disturbances as insomnia, nervousness, exaggerated euphoria, depression, and psychotic changes can be controlled by decreasing the dosage and using sedatives. Real psychotics are rare and occur only on high dosage schedules. If the disturbances are severe or persist treatment should be discontinued.

7. Miscellaneous Effects. Acne, hirsutism, rounding of face, purplish striae, etc., are caused by adrenal androgenic action. Should they occur they are generally resolved by decreasing the dosage.

As mentioned before, over-stimulation effects are not "toxic" effects and seldom pose any problem. They are readily reversed upon lowering the dosage or discontinuing therapy. In some severe diseases one may have to weigh such changes against the benefits of continuing treatment.

Contra-indications

ABSOLUTE contra-indications: known psychotics, chronic glomerulo-nephritis, Cushing's syndrome, and active or recently healed tuberculosis and active or recently healed peptic ulcers.

Relative contra-indications: hypertension (moderate elevation is not a contra-indication); severe diabetes (mild and moderate diabetics can usually be well handled by adequate insulin coverage) and congestive heart failure, unless there is reason to assume an improvement in heart function with ACTH as in acute rheumatic fever.

Though these have been considered as absolute and relative, it should be pointed out that even absolute contra-indications do not necessarily preclude the use of ACTH. Any decision not to use ACTH in the presence of these contra-indications must reflect careful consideration of the seriousness of the diseases and the extent of the contra-indications.

During ACTH therapy, should an unusual temperature elevation develop on a given dosage schedule, or fever develop when none was present before, withhold further injections of ACTH until the cause of the fever has been ascertained. Similarly, should there be a reappearance of pain, particularly abdominal pain, withhold further medication until the cause has been determined.

Indications

THE number of conditions shown to be favorably influenced by ACTH therapy has continued to increase. Though originally heralded for its reversing effect upon rheumatoid arthritis, ACTH today has established a far more important role. There are a number of important diseases, many are common everyday industrial conditions, that respond to treatment with this hormonal agent. Many of these conditions are in that category which respond dramatically to single, short-term periods of therapy. Among these conditions are those which respond more quickly to ACTHAR than to usual measures, and, in responding, the margin of safety exceeds that of commonly used preparations.

To the end that as practicing industrial physicians and surgeons we may better understand the importance and broad applications of ACTH therapy, the following list of diseases has been grouped into (1) diseases requiring short-term therapy, and (2) diseases requiring long-term therapy.

1. Diseases which generally only require short-term use:

Agranulocytosis[9]
Alcoholism and D.T.'s[6]
Allergy[10,11,14]
Angioneurotic edema[11]
Arthritis (rheumatoid)[1,2,25]
Asthma[13]
Beryllium poisoning[4]
Burns
Bursitis[24]
Contact dermatitis[3,11,12]
Dermatitis—exfoliative
Drug reactions
Eczema, urticaria
Eye, acute inflammations[5,23]
Gout[8]
Hay fever[14]
Acute hemolytic jaundice[19,20]
Insect stings—bees, wasps, etc.
Nephrotic syndrome[2]
Poison ivy[12]
Psoriatic arthritis
Radiation sickness[22]
Acute rheumatic fever[16]
Serum sickness
Snake and spider bites
Tenosynovitis[24]
Trichinosis
Urticaria[10,21]
Vasomotor rhinitis[13]

2. Diseases which generally require longer use:

Anorexia nervosa
Arthritis (rheumatoid)[7,17,25]
Asthma[13]
Beryllium poisoning
Ulcerative colitis[15]
Dermatitis—exfoliative
Dermatomyositis
Eczema
Regional enteritis[15]
Hematologic disorders (leukemia, Hodgkin's)[19,20]
Hypoglycemia, idiopathic
Hypopituitarism, functional
Loeffler's syndrome
Lupus erythematosus disseminatus
Pemphigus
Periarteritis nodosa[18]
Psoriasis
Psoriatic arthritis
Rheumatoid spondylitis
Scleroderma
Still's disease

Currently studies are under way evaluating the effectiveness of ACTH in:

Drug addiction
Dysmenorrhea
Eclampsia
Erythroblastosis
Infections
Liver damage
Migraine
Peritonitis
Raynaud's disease
Shock
Surgery
Tetanus

Among this wide variety are a number of

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conditions frequently encountered in an industrial medical practice; the therapeutic position of ACTH in an industrial practice is virtually as broad as is the field of this specialty.

Whether the industrial physician treats the "24-hour man" or is responsible only for occupationally-incurred situations, ACTH is assuming a prominent position therapeutically because it produces dramatic and speedy relief of symptoms, shortens convalescence, assists in rehabilitation and may be life-saving.[2,3,26] By reversing the disease process, crippled arthritics have been returned to complete or partial economic usefulness; workers with intractable asthma have resumed gainful employment;[13,25] employees incapacitated with beryllium poisoning have returned to work;[4] intractable, acutely inflamed eyes have been saved;[5] and sympathetic ophthalmia with its threat to complete blindness has been thwarted.[23] Lost time from bursitis, dermatitis, drug reactions, tenosynovitis, urticaria, etc., can be remarkably reduced.[11,12,24] All this constitutes a therapeutic triumph for the industrial physician and a new hope for the employee, employer and the community.

ACTHAR Preparations Currently Available

THE physician has a choice of several forms of ACTHAR all of which, however, are preparations of ACTH (Corticotropin). The dosages vary depending upon the particular preparation employed, and for this reason specific dosage regimens have not been discussed.

ACTHAR—This is a powdered form which needs to be reconstituted before administration. In the powdered form the hormone is stable indefinitely. It is given intramuscularly or subcutaneously. To induce a remission it is given every six to eight hours. When administered intravenously it is dissolved in 500-1000 cc of 5% glucose in water and given once daily as a continuous infusion over an eight-hour period. It is supplied in vials of different potencies.

2. ACTHAR-GEL—This is a long acting preparation of ACTH in a mixture of heavy gelatin and propylene glycol, administered intramuscularly or subcutaneously. It reduces the frequency of injections of ACTHAR (powder) from three to four times daily to the order of one or two times a day. It is supplied in multiple dose vials and in a disposable syringe unit.

3. ACTHAR H.P.-Gel—This is a Highly Purified low-solids ACTH in light gelatin. It is rapid and long-acting. It is given intramuscularly or subcutaneously, and is supplied in multiple dose vials and disposable syringe units.

Treatment may be initiated with any one of these preparations or the longer acting preparations may be employed after obtaining initial remission with ACTHAR intramuscularly, subcutaneously or intravenously. It has been demonstrated that ACTHAR intravenously as a continuous eight-hour infusion or ACTHAR H.P.-Gel will be effective in cases resistant to cortisone or the cruder preparations of ACTH. No patient should be considered unresponsive until ACTHAR has been administered intravenously or until ACTHAR H.P.-Gel has been employed.

ACTH (Corticotropin) has proved to be a valuable agent for treating a wide variety of acute and chronic conditions. More recognition should be given to the short-term uses of ACTH; there exist a number of situations in which a few injections can reverse a disease process and speed recovery. Also in intractable and resistant diseases, satisfactory control of the disease may be obtained, to the point that further economic crippling can be prevented by continued administration of ACTH in minimal amounts. It has been repeatedly demonstrated that ACTH as the sole therapeutic agent, or as adjunctive therapy to other agents, materially reduces the period of convalescence. It should be recognized that when irreversible damage is present, such prevalent damage cannot be expected to resolve and in this sense is a limiting factor in the efficacy of ACTH therapy. On the other hand the early use of ACTH will greatly increase the probability of successful therapy in many diseases, and will act to prevent or postpone the development of chronic or irreversible tissue damage with concomitant loss of function. The economic advantages of keeping the man on the job or returning him more speedily to gainful employment lends strong support to the use of ACTH in the many conditions facing the industrial physician as described in this paper.

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The Physician of Tomorrow

THE SLOW but progressive evolution of medical intelligence has brought medical thought through successive steps from the hazy horizon of antiquity to the bright light of today, made brighter by tremendous strides in the kindred sciences of chemistry and physics. During the last two centuries, the tendency to study the disease to the exclusion of its host—man, himself—has gradually but constantly developed. With all of the profound changes of the past two decades alone in the practice of medicine, with all of the brilliant contributions of science, there nevertheless appear signs that the pendulum has begun to swing to a more balanced position. A timely return to a modification of the Hippocratic tendency to view man as a whole, as well as his disease, appears under way. It has been aptly said that the physician of tomorrow must view disease with the telescope as well as with the microscope. Biologic, sociologic and psychologic influences must take their place beside the bacteriologic and pathologic factors. Medicine has a vital role in reviving a sick society. The social scientists almost uniformly believe that present day conflict between groups and nations results largely from years of cumulative mental immaturity, that for too long men of immature mind have held high office. But they—the psychologist, the sociologist and the cultural anthropologist—think in terms of the group and advocate suitable group disciplines. The physician, on the other hand, endowed with the means of preventing or curing disease, has the truly grass roots approach to the social problem for he has a peculiar opportunity to help the individual adjust himself to his environment. He is privileged to start at the beginning—with the individual and his family, the smallest unit of society. With the training to resolve psychosomatic problems, he can aid incalculably an ailing society through the basic step of implanting love, harmony and peace of mind within the family.

—From an Editorial in *J. Florida M.A.*, 38:11, 801 (May) 1952.

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Medical Services in Industry

— A Symposium —

ROBERT C. PAGE, M.D.: As spokesman and representative of the American Foundation of Occupational Health, under whose auspices this Symposium has been organized, it is my privilege to point out that one of the main objectives of the Foundation is to foster the discussion of problems peculiar to medical service in industry; to develop methods adaptable to the conservation of health among workers in industry; and to promote a more general understanding of the purposes of medical care for employees.

Today, business in the United States faces the growing tide of an aging population with its concomitant disability which threatens to engulf our life medically, socially, and economically.

Paradoxically, we in medicine have caused much of this through our scientific advances. It is understandable, therefore, that medical service in industry is a subject of growing concern to management, to the physician of tomorrow, to the employee, to the hourly worker.

Scientific progress is breath-taking in scope and speed. Medical science is apace of others. Medicine in Industry must not be embarrassed in this race.

The machine at present is helping rather than hindering mankind in his search for health. In years gone by, the conflict of man and machine was such that accident, illness and sudden death were almost expected as necessary for progress.

Now, thanks to the present interest in the field of medical service in industry, leading universities are conducting teaching and research programs supported by both labor and management in order to improve the health of the worker.

Top executives and experts in scientific management, and representatives of medicine, nursing and industrial hygiene are holding frequent meetings on various phases of the subject.

Our speakers are from four leading university medical centers.

The point of view of management will be expressed by the representative of an industrial organization highly respected for its vision and progressive action in the rapidly growing medical phase of human relations.

[This Symposium, titled "Panel Discussion—Medical Services in Industry," and organized and directed by DR. ROBERT COLLIER PAGE, was held Thursday afternoon, April 24, 1952, at a General Session of the 1952 INDUSTRIAL HEALTH CONFERENCE, at Cincinnati, Ohio.]

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Viewpoint of the Profession

A. G. KAMMER, M.D.

OCCUPATIONAL medicine may be defined as that field of practice which deals with medical problems that are caused or aggravated by factors of employment or which have their solution in factors of employment. Physicians work professionally in this field in one of several ways: as practitioners who provide services and consultation from their own offices to employees or employers, or to agencies which serve these groups; as investigators or administrators in the employ of governmental bureaus or insurance carriers; or as in-company physicians on a full-time, part-time, or on-call basis. The work of in-company physicians may be further classified according to its nature and place of performance as general administrative, hospital, or in-plant. It is the last which is under discussion here: in-plant service, as considered independently of the proportion of the physician's total working time devoted to the service. The term, in-plant is used to designate a place of actual employment be it a factory, an office, a hospital, or what-not. When the in-plant service is expanded to include the work of nurses, engineers, and other health professionals it is to be regarded as an industrial health service rather than as an industrial medical service in the less inclusive sense. In this circumstance the service properly concerns itself with a broad application of measures of prevention, health maintenance, and optimum worker-job relationships in addition to the activities related to therapy.

The scope of an in-plant service is found to vary from the provision of simple first aid as a matter of convenience to employees, to highly complex activities of a professional team engaged in the solution of a subtle health problem which may be critical to the continuation of a manufacturing process or even to the survival of a business.

The service is necessarily adapted to the setting in which it operates. It may be the prin-

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A. G. KAMMER, M.D., was born in Darlington, Wisconsin; graduated at the University of Wisconsin, 1926; received his Medical Degree at the University of Pennsylvania, 1928; interned at Philadelphia General Hospital, 1928-'30. After four years in private practice, and two years with the Montreal (Wis.) Mining Company, he became Medical Director of Inland Steel Company in East Chicago. Later he was Medical Director of K-25 Plant, Oak Ridge, Tennessee, and in 1946 he was appointed Medical Director of Carbide and Carbon Chemicals Company, in South Charleston, West Virginia. Since 1949 he has served that company as Consultant Medical Director. At present, DR. KAMMER is Professor and Chairman of the Department of Occupational Health at the Graduate School of Public Health, University of Pittsburgh. He has been Consultant to the Bureau of Industrial Hygiene, Department of Health, State of West Virginia, since 1949. He is a Director of the American Academy of Occupational Medicine, and is immediate Past-President of the INDUSTRIAL MEDICAL ASSOCIATION.

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cipal and supporting medical service of an isolated community whose existence depends upon the payroll of the plant, or it may be fitted into the private medical care and public health facilities of a metropolitan area which is, among other things, an excellent medical center. The total occupational health program of a corporation with foreign branches must concern itself with the broad factors of world health.

Although precise information on the point is not available, the probable order of frequency with which in-plant activities are carried on is somewhat as follows: treatment of occupationally sustained injuries and illnesses, counselling and minor therapy for non-occupational conditions, pre-work examinations, post-sickness absence examinations and counselling, and interval examinations of limited scope to determine eligibility for continuance at hazardous jobs or to discover specific evidence of occupational disease. These are the activities most commonly found, and they are arranged in the order in which they are likely to be developed in an in-plant service. Activities less frequently found are: complete interval health examinations, precise environmental studies which may or may not be correlated with specially designed examinations of potentially exposed workers, health education, and executive health programs. Multiphasic screening procedures tend now to supplant complete interval health examinations. Psychologic tests the purpose of which is to define the emotional patterns of workers are properly administered within the plant medical department.

Discussions of the procedural content of the activities which comprise in-plant health services are included in the papers which follow in this series. The actual list of activities that comprise in-plant services will vary with the recognized needs of each plant, although there is a minimum below which it is inadvisable to go if the service is to be provided at all.

Prevention, in the literal sense of the word, is practiced with regard only to two classes of disease: occupational conditions the cause of which is known and controllable, and infectious diseases for which immunization procedures are available. With respect to the latter, the in-plant service participates in the community's public health program. As pointed out by O'Connor, our control efforts with regard to chronic degenerative disease are really based upon early discovery and early treatment rather than prevention, since prevention of these conditions is not as yet understood. Early discovery may result from an in-plant service activity, whereas early treatment is provided by physicians outside the plant. The in-plant service may make contributions to prevention in other areas: production losses and accidents may be reduced as a result of better placement and a better understanding of the inter-relationships of man and machine as well as the inter-personal relationships between man and man, and the tensions of labor relations may upon occasion be diminished as a result of opportunities for an insight into inter-personal relations from the vantage point of the in-plant health service.

Facilities

THE SCOPE of activities which comprise the in-plant service, the professional capacities of those who provide the service, and the facilities provided for their work should be kept in harmonious balance. Deficiencies in equipment may in some measure be compensated for by unusual competence of professional personnel, but the reverse is not true. In general terms, the equipment on hand at the most completely furnished in-plant dispensary need not exceed that to be found in the outpatient department of the best hospital in the community in which the plant is located. Usually considerably less than this is adequate with the exception that there may be emphasis upon one or another kind of equipment to meet the special needs of the plant being served. Two items, worthy of special mention, are occasionally given inadequate consideration. These are, first, sufficient space in which to carry on good work with more privacy than is usually provided for an industrial activity, and, second, the equipment necessary for the maintenance of good records. These two may be considered the fundamental requirements with respect to the facilities needed for a good in-plant health service.

Significance

IT IS WELL to keep in mind that the professional field of occupational health grew up almost without guidance or subsidy, and that its growth has been in response to needs that have persistently demanded attention. These needs have been and will continue to be both social and scientific. It will not be possible to ignore them in the future any more than it has been possible to deny them in the past. With our industrial activity increasing both in size and complexity at rates that are geometric rather than arithmetic, it is unlikely that either the social or technical needs responsible for the early growth of this new professional service will in the least diminish. There is a growing awareness on the part of clinicians of the necessity for the broadest possible understanding of their patients. A sizeable portion of the total experience of most adult patients is job related. The full meaning of the component to the whole can only be grasped when there are good health services inside the plant as well as outside, and when there is good communication between the professionals who provide the two kinds of service. Without such a well-rounded grasp of the total problems of workers, it is likely that the limiting factor of industrial expansion will be the capacity of man to live with it.

An event of great importance to this whole matter has been entrance of universities into the field of occupational health. Several have or-

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ganized special faculties comprised of clinicians, engineers, chemists, physicists, statisticians and epidemiologists whose total interest is this field. The faculties take primary responsibilty for the graduate training of specialists in occupational health. They depend upon the help of associates in teaching hospitals, in other colleges of the universities with which they are associated, in other affiliated educational and social institutions, and in selected industrial plants. In some instances, the faculties conduct direct research upon industrial health problems and provide a group type of consultation service. They have the double opportunity to alert appropriate faculties located elsewhere in the university to the possibilities of contributing to the mutual adjustment of man and his work, and to provide the intellectual ferment which will activate useful endeavors toward this end. The professionals who receive post-graduate training at such centers are expected not only to have competence in the recognition and solution of problems, but also to catch the vision that industrial employment and the activities related thereto can and must be a positive experience resulting in improved health in the broadest sense of the term.

Viewpoint of Management

RALPH M. MONK

ALL OF US realize that while the act of living is at all times a risk, whether a man is working or not, we want to make certain that insofar as humanly possible a man's occupation or the conditions under which he labors shall never be a cause of his ill health, disability, or premature bodily decay. Nowadays while the employer is concerned about the output of work, he is more concerned with the ways and conditions in which that output is obtained. In this connection it is my belief that the employer's philosophy of medical services in industry is fundamentally an attempt to increase the sum total of human comfort, well-being, work ability, productiveness, and longevity. Might I also add that this to a large extent is the ultimate objective of all human endeavor whether it be in the realm of politics, religion, science, medicine, or business management.

It is recognized universally that every institution is specialized to perform one particular function—the bank, to handle our money; the hospital, to care for our sick; the police department, to guard our personal safety, and so on. Interference with these respective functions cripples or destroys the institution. The function of industry is to produce goods needed by society as a whole. Whatever interferes with the well-being of employees threatens industry and society built upon and around it. Contrariwise, anything which improves the health of employees strengthens, improves, and develops our industrial might, thus making society better generally and the community healthier.

As I review industry as a whole, I recall the fine pages written into the archives of industrial America when it grappled successfully with the problem of physical safety. How well the job was done is told in the statistics by declining accident rates. These fine results are truly a proud chapter of management progress and achievement.

There have been many accomplishments of industry which have been monumental in conserving our human resources. Today we look with satisfaction on the record industry has made in lightening human labor—machine production and technological development all of which have extended the production power of human energy. A large part of this conservation of human energy was made possible through acceptable and adequate medical services in industry which has taken that human machine, of so delicate and so complex a pattern, and surrounded it with protective measures provided by advances in medicine. Expressing it another way, it means that physiological specifications as well as engineering specifications were considered, evaluated, and put into use by competent medical personnel.

Management's problems in the field of human relations are those of efficiency, labor turnover, absenteeism, job dissatisfaction, promotions, job transfers, proper placement, etc. These are associated with certain economic factors, labor and industrial relations factors, as well as community good-will practices, any or all of which have some bearing and are interwoven into the very fabric of this broad subject of medical services in industry.

These problems will continue to confront us, and there most certainly is need for continuation, expansion, and greater application and appreciation of medical services in industry. If such services are to be on a high plane, the approach must be realistic and practical in order to provide the greatest benefit to those employed.

The man or woman who works, very often seeks a place where medical care and health facilities are of a high standard. They offer a protection and safeguard to his health. Where such programs exist, he sees physicians and nurses at work and develops confidence in their professional ability. Many of these applicants have never had a physical examination. Perhaps many of them thought they were in perfect health. However, when informed of their defects, they are given a better chance to add many healthy years to their lives. They naturally come to see industrial medicine not only as a profession that seeks to cure but also as one that seeks to prevent. I feel certain that these attitudes are carried to their jobs, their homes, and their communities.

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ONE of the first over-all impressions that a new employee gains about a company with which he seeks employment is made by the medical program. Medical services give dignity to the individual as opposed to the collectivist concept of treating humanity in the mass.

The success of medical services in industry depends largely upon three principal factors: (a) the sympathetic and genuine interest of top management together with its supervisory staff, (b) wholehearted cooperation and loyalty of employees, (c) a thorough, competent medical staff in which both management and employees have complete confidence.

To direct such services in industry, specialists are needed; specialists in a degree as great as in any other important function of a business. The best ones are special kinds of doctors, with exceptional personal characteristics. They are the physicians with an interest in and consequent knowledge of the plant operations and processes. They are familiar with the manufacturing materials handled, with the job skills and efforts required in the various jobs. They learn to understand habits and reactions of employees. They are sympathetic and confidence-inspiring. Such physicians are invaluable to a company. In summary, they know and understand people as well as understanding medicine.

Some may say that all this represents "big plant stuff." It may as well be argued that production efficiency itself is strictly a big plant matter which small plants cannot afford. This is not true. Surveys now indicate that medical services are becoming more widely accepted regardless of the size and type of the industrial establishment. We are not fostering foolish fads or indulging in vague humanitarianism. Actually we might be considered as "trustees of human health." The fact that we in industrial relations are paid by industry indicates that we have this obligation. As a matter of fact, it is not just an obligation or a responsibilty but rather an opportunity to serve mankind.

In dealing with medical services, there are certain principles which govern their development and expansion. (a) Management has a moral and legal responsibility to protect its employees against special hazards to health and work situations hostile to their well-being. Measures of this type are not matters of choice, but essential and inalienable duties. Under this heading, we consider safety engineering, control of atmospheric contaminants, proper illumination, good plant housekeeping, adequate and proper ventilation, care of industrial injuries and illnesses, and accident prevention. (b) Management has a clear right to provide additional medical and health services which promote efficiency in industrial production. Under this heading we consider essential such items as physical examinations of employees for proper placement, periodic examinations where unusual hazards or exposures might or could exist, emergency care of non-occupational illnesses and injuries, psychological services for the adjustment of the worker to his task and those emotionally disturbed, health education, medical counselling as to health habits, adequate feeding facilities, opportunities for physical exercise and recreation, and opportunities for the physically handicapped. These are matters of common justice, as between man and man.

THE potentialities of an adequate and proper medical service cannot readily be interpreted in dollars and cents value. Who can calculate the value to our company in the reduction of lost time by curbing sickness or epidemics? Furthermore, it would be most difficult to appraise the assets to our company, or the economic savings accruing to our employees resulting from our over-all medical service program. What about the many daily consultations, referrals, and medical opinions offered employees, and those, even involving their families, which are aired daily in the industrial physician's office? These early illness consultations and early symptom appraisals in themselves have added to the salvage effort a great work of creating conditions in which a healthy population can flourish.

It is obvious that the employer is not responsible for many ailments from which workers suffer, and there would be little reason for being interested in the problem they present if the worker would look after his own health, or if the community, as a whole, did its part. But under present circumstances, hardly any other course is open but for the employer to shoulder some of the responsibilty up to a given point at which time the industrial physician works with the family doctor in administering to the medical needs of the worker.

If we Americans had the know-how to invent or develop the phonograph, telegraph, automobile, airplane, radio, television, and the atom bomb, then certainly we have the understanding to take advantage of the opportunity that medical services in industry offer, so that we can assure a continuance of faith in free enterprise.

The purpose of medical services in industry is not to make money but to make health. Any financial advantage is essentially a by-product and must always be recognized as such.

Management executives often hesitate to embark on a program of medical services or to change the "old for the new" because they are looking for answers to such questions as:

1. How much will it cost?
2. What are similar establishments the size of mine doing about it?
3. How much of a program does my plant need?
4. What standards of medical services can be called acceptable?
5. How can I justify the expense to the owners of the business?

The measuring rod that will enable all of these

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to be answered to the satisfaction of everyone who asks, has not yet been devised. However, it is not so much that any particular industry cannot afford a health program; it is rather that it cannot afford to be without one.

In conclusion we can say that an adequate medical program benefits the employer as it affords better job placement, assures a healthy working force, improves employee-employer relations, promotes safety and community relations, and permits proper use of handicapped individuals. The employee benefits because it affords proper job placement, provides him information about his physical condition, aids in adjustment of his work, protects fellow employees, assists in up-grading, increases the period of gainful productive employment, insures a more stable economic security, and prevents development of disabling diseases.

The emphasis today in industry is on people, the most important and most valuable resource of all. We must bring into play the individual's capacity to work in a team and his ability to coordinate a great many different things.

The industrial physician has a most important role in safeguarding the health of the nation's work force.

The Industrial Physician Past, Present, and Future

O. T. MALLERY, JR., M.D.

PHYSICIANS from earliest history have dealt with the art and science of health and have treated disease and accident arising from industrial activity of the times. A backward glance is at once helpful, for our present-day concepts have grown from and are influenced by past experience. The future is predictable only to the extent that analysis of past and present may serve as a guide. Before we proceed further, it is necessary to orient ourselves in time as to "The Past, the Present, and the Future."

The Past

"THE PAST" might be designated the period prior to the advent of workmen's compensation. Industrial medicine, as then known, was largely industrial surgery. The steel companies, particularly in Pennsylvania, and many railroads had begun their medical services for employees as early as the 1880's, their top medical officers being designated as chief surgeons, or company surgeons. And many lumbering and mining operations, especially those in isolated areas without access to urban medical facilities, had established medical departments rendering almost complete service to both employees and community. Meanwhile numerous large employers in various kinds of business had inaugurated medical services along lines which later set the pattern for the modern medical department. Andrew Harvey became the first Medical Director in the United States in 1896; Dan McDonald organized a medical service for Firestone Tire and Rubber Company in 1904; Harry Mock, as Chief Surgeon for Sears Roebuck and Company, developed the pre-employment physical examination in 1908. In 1914 Magnus Alexander organized the Conference Board of Physicians in Industry, with 32 Medical Directors, mostly from the New England States. In October, 1917, Dr. Franklin Martin, chairman of the medical section of the Council on National Defense, organized a subsection on industrial medicine. According to Dr. Mock, "This committee proposed elaborate plans for the supervision of the health of all workers engaged in essential war occupations. Few of those in authority were familiar with this new field of medicine, and it took weeks of patient endeavor to sell the idea." On May 27, 1918, Dr. Otto P. Geier, director of the committee, submitted an excellent report on "Industrial Medicine and Surgery as a War Measure." During this year also, Dr. C. D. Selby made an extensive survey, under the Working Conditions Service, of industrial establishments in the United States and Canada, which was published by the U.S. Public Health Service as Bulletin No. 99 (1919) under the title, "Studies of the Medical and Surgical Care of Industrial Workers."

With the entrance of the United States into World War I in 1917, and the rapid spread of workmen's compensation statutes among the states, the "Past" moved quickly into the "Present."

The Present

INSOFAR as it may have any boundary, the present, as distinguished from the past, may be said to have its beginnings in the second decade of the present century. The arrival of the industrial physician of today was hastened by the social and industrial development of that very period. Many things, ranging all the way from tragic disasters to beneficial discoveries, have helped to concentrate attention on morbidity and mortality among employed people, and have given added impetus to the enactment of regulations and the establishment of medical services in the interest of improved health and safety for the working population. Management now faces squarely the costs—many of them new costs—from accidents and illness. And the leaders of the medical profession now devote themselves to the study of occupational disease, and qualified practitioners join the investigative teams in a search for practical ways to bring medical knowledge to bear on the prevention of both.

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The Practice of Industrial Medicine

TODAY, the physician in industry achieves the aims of prevention, prompt recognition, and proper treatment of occupational accident and illness through several complementary approaches. First, by the practice of clinical occupational medicine, he brings his professional and clinical medical training to bear to achieve early diagnosis. From past clinical experience and from the labors of medical research, he is provided with a guide to prevention, for the certainty that disease will follow where man is subjected to specific work conditions has led directly to control methods for the environment and the institution of safe work practices. Where both prevention and early diagnosis fail and disease or accident follows, the physician in industry is ready to offer special knowledge to facilitate recovery, and to achieve individualized rehabilitation based on knowledge of the job.

The industrial physician is in a particularly favorable position, for by direct association with the work place, accessibility to the employee, and observation of the work activity, he is provided with practical measures to evaluate the influence of employment on the group and on the individual. He is unique within the medical profession, for through observation of man at work he can, with experience, integrate his medical background with the practical problems of the workshop and realistically appraise the effect of the job on the man, and the capabilities of the man for the job.

To management, the industrial physician provides practical advice on safe practice and disability prevention. To the worker, he serves not only as a safeguard against the occurrence of occupational disease, but also supplies a constructive program to maintain, and where possible to improve, the employee's over-all physical and mental health.

Present-day industrial medical practice is good clinical medicine. The worker, however, is not merely a case history of an interesting clinical and occupational disease. By the industrial physician, he is regarded as a whole man with both individual and group reactions to his work, to his personal illness, to accident, to the immediate environment of the work place as well as to the community and to his family.

The present period finds the industrial physician concerned with a constructive, positive approach to health maintenance. For example, he looks for deviations from health rather than waiting for the manifestation of overt disease. The wide acceptance of the periodic or annual health examination is designed to emphasize health maintenance first, with preventive and corrective measures as adjuncts to abet positive health.

Lastly, we have seen develop during our present period a diversified team of professional people who have joined with the physician to constitute a medical health service. In this development of a complete health service, the physician has welcomed the nurse, hygienist, chemist, engineer, safety expert and others. Each can now serve his special purpose, to the common end of prevention of accident and disease and the promotion of health.

The Industrial Physician and the Community

THE industrial physician, because of his accessibility and his genuine interest in the individual worker's health, is sought by the employee for counsel and guidance in general health problems beyond those of occupational origin. This provides an opportunity for him to encourage the employee to seek prompt medical care from his family physician. Frequently such prompting leads to earlier diagnosis, shorter subsequent disability, and reduced economic loss. In other instances, he provides health education, which results in improved health practice and greater demand for medical care for the employee and his family. The family physician, by professional contact with the industrial physician, is provided with usable factual professional information essential to assure medical care designed to return the worker at the earliest time to useful productivity. Close contact between the industrial physician and community medical and health services is likewise mutually advantageous, for only then can the total health of the work force be maintained.

Medical supervision and care for the eight-hour, five-day week serves an important purpose, but man, the worker, his health and that of his fellows, are almost equally affected by community health standards, professional facilities, and the availability of specialized professional personnel.

Professional Responsibilities

IT IS essential that the physician in industrial practice maintain his professional and scientific independence. His medical records, the case histories of individual employees must remain professional, privileged, and confidential matters between the physician and his patient. Only in this way can he keep an unbiased professional position and thereby serve the best health interests of the individual and the work force. His professional opinion must not become a matter of controversy between labor and management, and it must always be rendered impartially to that end which best serves the interests of health.

This present period has been one of rapid growth for the field of industrial medicine. This field is now attracting more professional men who are qualified to provide specialized health counsel in our modern industrial economy.

The Future

THE future holds promise that physicians in industry will be even more numerous and that they will benefit from special academic

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medical preparation to this end. Medical training derived from current in-plant experience will prepare them in advance for this special field of professional practice. Until recent decades, no fund of knowledge and experience was available for study, and consequently, the present-period physicians who have contributed most to occupational medicine have been largely self-taught. The new generation of physicians entering industrial medicine stands to profit by the experience of our current leaders, and more quickly achieve competent and effective service. From the experience of the industrial physician of today will develop the pattern of training for the professional man of tomorrow.

In the future, the physician in industry will be freed somewhat from the more routine of his traditional clinical duties to engage in investigations into the multitudinous challenges that environment, work activity, job specialization, and the problems of normal aging and retirement impose on the productivity and well-being of man. Few fields of medicine are more open to research. Such disabilities as silicosis and lead poisoning, both known to man since antiquity, still need much study. New diseases, new stresses are ever present in the changing order of our productive economy, which constantly seeks new materials for old, and better methods to do the job. The industrial physician is placed in a position of rare opportunity to study man, and he will continue to extend at an accelerated rate the record of his observations and findings as related to the industrial environment. Our culture is based on man and his mastery of the machine, and it is fitting that medical science join with technology to assure his continued health and productivity.

Industrial Hygiene—Past, Present and Future

PHILIP DRINKER, Ph.D.

MY ASSIGNMENT in this symposium suggests a discussion of three eras in the field of industrial hygiene—past, present, and future. Of these the past is the easiest because it allows us to show the wisdom of our hindsight—something most of us find hard to resist. We read in Agricola, 1556, of metallurgical and mining methods which harmed workmen—they had lead poisoning, silicosis, mercury poisoning and probably metal fume fever. Poisoning from arsenic was known and recognized. Skilled craftmen, artisans and artists did work we admire today—much of it at the expense of the health and even the life of the worker.

Medical inspection of factories and of mines in Britain certainly antedates its counterpart in the United States. Routine dust counts were made in the South African gold mines before we were doing them. Chronologically, industrial medical work in Germany also antedated ours. But industrial hygiene, as we know it in the United States, was peculiarly American in history and in development. This monopoly, if it ever existed, has been broken by our colleagues in many countries.

The Past

THERE was virtually nothing we would call industrial hygiene anywhere until well after the industrial revolution in Britain along in the 1830's. Power was supplied by water, later being displaced by steam, and today by electric power. Rock drills, run by compressed air, came into use about 1870. Leyner's rock drill, with hollow bits, was introduced about 1897, and with it came wet drilling.

Today the mining and metallurgical industry can look back on a long succession of industrial developments which have made possible the recovery of metals like lead, copper, zinc, gold, and silver which could not have been done formerly at a profit—and industry has to run at a profit or else close down. Unquestionably some of the new processes introduced risks to health which were not appreciated at the time.

In retrospect the mistakes or the omissions were serious—as late as 1915 in South Africa, in Britain, and certainly in the United States, there were plenty of intelligent people who did not believe fine quartz dust was harmful. I saw a man sandblasting castings on the open floor of a large foundry in 1930, in Detroit, and he had no protection other than against abrasion by the flying particles. It could have happened in New England. I bear no malice towards Detroit.

A novel by Thomas Reade, "Put Yourself in His Place," written in 1870, should be required reading by all students of industrial hygiene today. He dealt most interestingly with lead poisoning and its prevention in the manufacture of files. His hero introduced safety measures into the tool grinding industry and tried to quell the labor unrest which followed on the heels of some good mechanization. Fascinating accounts of our sins of the past appear in the books by Alice Hamilton, Thomas Legge, and our own Carey P. McCord—I say "our" designedly because McCord has been and still is one of the warmest and most effective supporters the medical profession has given to us in industrial hygiene.

In 1906 New York State provided for the appointment of a physician to be known as a Medical Inspector of Factories. The staff gradually was increased and in 1913 included a mechanical engineer and a chemist in addition to

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PROFESSOR PHILIP DRINKER was born in Haverford, Pennsylvania; graduated from Princeton University, received the Degree of Chemical Engineer from Lehigh University, and D.Sc. from Norwich University in Northfield, Vermont. In 1922 he was appointed Instructor in Industrial Hygiene at Harvard Medical School. Since that time he has progressed through Assistant and Associate Professorships, and since 1936 has been Professor of Industrial Hygiene at the Graduate School of Public Health, Harvard University.

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the physician. In 1924 the Division of Industrial Hygiene of New York was made an independent body as the "Bureau of Industrial Hygiene" and started publishing its *Industrial Hygiene Bulletin*. In 1936 Leonard Greenburg, a physician who started out as a sanitary engineer, became Executive Director of the Division. The various bulletins, codes and rules formulated by New York have set the pattern for such things throughout all the states of the union.

In 1914, within the Division of Scientific Research of the U.S. Public Health Service, there was created an office of Industrial Hygiene and Sanitation Investigations. This same year A. J. Lanza and others from the Bureau of Mines and the Public Health Service began their study of the silicosis problem in our tri-state district. From 1920 to 1930 the Office of Industrial Hygiene was under the direction of L. R. Thompson, a physician of great experience in the general field of public health. He initiated the Service's series of surveys of the dusty trades, which were continued and expanded by his successors.

In 1937 the organization became the Division of Industrial Hygiene under the very able leadership of R. R. Sayers who had been for some years surgeon for the Bureau of Mines. Sayers taught electro-chemistry and physical chemistry at Buffalo where he took his medical degree in 1914.

The laboratory and field studies at Saranac Lake were initiated by L. U. Gardner, a pathologist, in 1920 and virtually set the pattern for such work throughout the entire world.

The Bureau of Mines was established in 1910 within the Department of the Interior. About 1917 during World War I the Experiment Station at Pittsburgh was under the charge of a chemist, A. C. Fieldner. One of the Bureau's duties was the supervision of safety in mines, so it was natural that they should assume the testing of safety equipment. Their program included appraisal of masks for protection against gases. Their special knowledge was used by the Chemical Warfare Service, and after World War I the Bureau began issuing its specifications for protective equipment of all kinds. Industry accepted these specifications with alacrity, and industrial hygiene benefited.

The *Journal of Industrial Hygiene* appeared in 1919. The Chief Editors were physicians, David L. Edsall for the United States, and Thomas M. Legge (later Sir Thomas) for Britain. My brother, Cecil K. Drinker, a physician and physiologist, and his wife, Dr. Katherine R. Drinker, carried the real responsibility, and the prompt success of this journal was due to them on this side of the ocean and to Collis in England. Early contributors included a few men in general public health, like C. E. A. Winslow and occasional chemists, A. C. Fieldner, S. P. Katz and W. P. Yant, but the general tone of the papers was medical.

Dr. Alice Hamilton and Dr. C. K. Drinker, of our Faculty at the Harvard School of Public Health, suggested that we should expand the Journal's field to include some engineering. We asked Yant, then of the Bureau of Mines, to join the Journal's staff, and I became Managing Editor. The kind of papers we received began to include more industrial hygiene, and industrial medicine, with less industrial surgery and industrial orthopedics.

In 1935 a group of industrialists, physicians, and industrial hygienists, with the Mellon Institute, formed the Air Hygiene Foundation, later changed to the Industrial Hygiene Foundation as its scope and interests expanded. In 1938 the Governmental Industrial Hygienists, with J. J. Bloomfield as the coordinating figure, organized into a group which included all those in Federal and state industrial hygiene bureaus. In 1939 the American Industrial Hygiene Association was formed, with Yant as its first president.

The *Federal Industrial Hygiene Newsletter* first appeared in 1940, and today, as *Occupational Health*, is one of our most important publications in the field. The program of our AIHA annual meeting this year lists a collection of technical papers on industrial hygiene subjects which I think rank favorably with any in the whole field of hygiene.

The Present

THE concept of specifications which define working conditions belongs to industrial hygiene without any dispute. About 1940 the American Standards Association at the instigation of the late Steven R. Whiting, of Liberty Mutual Insurance Company, formed a committee to formulate "Allowable Concentrations" of such impurities as carbon monoxide, lead dust, and various solvent vapors. The series of approved reports began publication in 1941. A few years later the Governmental Industrial Hygienists started their less formal but more realistic series "Threshold Limit Values" which now are revised and published annually. As a practical guide to control of conditions they are most valuable and are used all over the world.

I would give great credit for control of industrial disease to the workmen's compensation acts which really go back to Bismark. Industrial hygiene is an off-shoot of preventive medicine, and most industrial illness is preventable by means at our disposal. It is now accepted that industry should pay the cost of illnesses and accidents "arising out of and in the course of" a man's work. Employers object to unwarranted decisions and miscarriages of justice, exactly as we all do, but the abuses of the compensation laws get less frequent every day.

COSTS: All of us have heard it said, especially by our bureaucrats, that we cannot measure impairment to health in terms of cash. Perhaps we can't with real precision, but we can and do come pretty close to it. Otherwise why have

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fixed prices for loss of a limb or of an eye. All of us budget for insurance against accidents, or loss of life. The Blue Cross and comparable schemes are founded on the values we are willing to set, insurance-wise, on various disabilities including planned hospitalization, as for childbirth. Our medical colleagues in industry operate on a budget. They don't get a blank check from management to be settled on a cost-plus basis as a result of experience. They must run their departments to come out in the black and not in the red.

This is even more true for us in industrial hygiene. About 20 years ago Professor Theodore Hatch and I made estimates for dust control in a granite cutting plant. They were several times the value of the unit in question. We then supported the management's plan to build a new unit with complete modernization and good dust control as an integral part of operations. Such procedures are now commonplace in industry. We have to have an eye to production costs and for that reason are closer to the problems of production than are you doctors.

Many of us do not feel that industrial hygiene should be dominated by the medical department. It is better to keep it as a service unit accountable to the production department but at the service of the physician. I admit we find plant doctors who are very conscious of production costs, but they are apt to be straying from their medical roles when they assume such responsibilities and there is no reason why they should do such things particularly well. If all you want of the industrial hygienist is periodic checks of conditions, go out and hire a smart young graduate of high school and teach him to be your technician at a technician's wages. Don't make the industrial hygienist the catch-all for odd jobs—it won't work.

AIR POLLUTION: I suppose cancer is today about the most vexing of the medical problems. It is usually classed as one of the so-called degenerative diseases of later life—a disease of "unknown etiology." Anyone who can clarify the etiology or prevent cancer will be welcome. It is fitting that industry should be watched carefully to see if it contributes to cancer. The sanitary problems of industrial civilization haven't all been solved, and it is natural to look with suspicion on air pollution as a possible contributor to cancer. But we might as well face the fact that epidemiological data, from industry, are rarely good experimental data. If a particular industrial process is suspected, management's immediate answer is to change the process. The experiment, as the lab man sees it, is thus spoiled completely and for good.

A recent example is Shaver's disease and its counterpart in Germany. The probable cause was excess fine fume of SiO_2 and Al_2O_3 which resulted from overloading of plant capacity. Management answered promptly by process changes and good ventilation so the disease has been eliminated before the etiology was defined.

It is proper that industrial hygienists should join the meteorologists and combustion engineers in measuring and controlling air pollution. It is not a new problem in any of its aspects but it is certainly looming large in the public eye. A fair share of the program of these meetings is devoted to the subject—something which has not happened before this year. Presumably it will continue to be a major item on our future agenda.

The Future

FORECASTING the future of industrial hygiene is a bit presumptuous, as forecasts have an unpleasant way of bouncing back and facing you down with guesses you wish you had not made. When the atomic age was ushered in during the last few years, health physics and industrial hygiene more or less married and lived in harmony but in some cases distinctly without benefit of clergy. Anyway the professions discovered each other and their experts became friends. We now have them sitting together in the same meetings, talking the same language, and publishing in the same journals. I admit I cannot understand all of their new vocabulary.

Owing to some splendid planning and plenty of money, our various atomic energy plants virtually avoided illness due to radiations. Their industrial physicians and hygienists found that their illnesses were no different from those in plants of the earlier decade. They showed, by virtue of their great need of safe operations, that even the commonplace industrial accident could be reduced below the best we achieved 10 years ago. Today we have a substantial group, from industrial hygiene, specializing in the health problems connected with the use of atomic energy. That this development is here to stay and will be greatly expanded seems a certainty. For the teaching institutions it poses a real problem because developments are so rapid it is difficult to keep up with them.

Ten to 20 years ago we worried a bit about fatigue of workers but now you hear little of it. Industry's answer to such complaints is invariably improvement in process and increased mechanization. Monotony, consequent to mechanization, is more vexing because the supposed improvement may be the cause of the complaint. Not infrequently mechanization has resulted in unwanted noise—riveting, drop forging, pneumatic hammers of all kinds, weaving looms, jet engines, and others to come. The industrial hygienist finds the problem of noise and its control literally landed in his lap. At the moment we lack a reasonable definition medically or legally of what is normal hearing loss as one gets along in years.

TRAINING: Up to the present time the Public Health Service has been alloting funds to the state industrial hygiene units and encouraging

them to send properly qualified students to various universities for training in industrial hygiene and industrial medicine. These graduates have then returned to the state units and, by a friendly understanding with the states, are not supposed to enter private industry until they have served at least two years with their state unit.

The funds for these training periods are from the Federal government, taxpayers' money, and are for the express purpose of encouraging men and women to enter this field. Some of the best men we have today in private industry got their practical experience in state and Federal jobs. An important part of their later duties in industry involves working with their former colleagues.

But this program does not always engender good will with the state units. It is often better for a company needing these specialists to select from their own ranks qualified students and send them to various universities. They should stay for at least a full academic year. For industrial hygiene we, at my own school, prefer men who hold a degree in sanitary or chemical engineering but we have had good students with degrees in chemistry, and electrical, mechanical, and mining engineering. Stipends or fellowships granted should be comparable to those offered by the various foundations and by the government agencies.

The salaries these men command on graduation and return to industry are comparable to those industry now pays its technical men of the same age group. From that time on the salaries depend upon the individual and what he and the company ultimately make of the job.

The Industrial Nurse—Past, Present and Future

MARY LOUISE BROWN, R.N.

INDUSTRIAL nursing's future can be visualized if we look at the reflected glow from the past, and if we face the bright light of reality that is the present. The past reaches back to the latter part of the nineteenth century when a hazardous industry employed a nurse, not to care for the workers, but to give home nursing service to the workers' families. This type of nursing spread, and during the early years nurses employed by industry served in the homes of the workers, not in the factories. These women were industrial nurses when the common law doctrine ruled, and we do not find nurses working in industry until after compensation laws were passed. Then the cost of industrial injuries was added to the over-all cost of production, and nurses, who had been serving the workers' families, were established in first aid stations within the factories. It is from this period in industrial nursing's past that the connotation of industrial nursing as first aid or finger-wrapping has come. These early nurses were women of vision and they based their programs on service—to the worker and to industry.

The first world war and the resulting industrial manpower shortage pointed up the importance of the worker to industry. This same period gave industrial nursing its first great impetus. Prior to 1914, less than 60 firms employed nurses, but by 1918 the list included 871 firms employing 1213 graduate nurses.[1] During the depression of the thirties, the nurses who were still employed found that relief and health counseling activities composed the largest part of their work.

The present era of industrial nursing covers the years from the tragedy that was Pearl Harbor and the second world war to our present unsettled war-geared economy.

The latest nurse census lists 10,796 industrial nurses.[2] The activities of these nurses are the basis for the definition that says "Industrial nursing is the practice of the art and science of nursing in industry to meet the needs of the workers, for the purpose of developing and maintaining the highest potential level of health and efficiency through prompt remedial care of the ill and injured, health and safety education and cooperation with all health and welfare agencies."[3]

THE present trend of industrial nursing follows a rather well-defined pattern. The large companies employ groups of nurses, these nurses working as members of their company's occupational health team. The leader of the team is the full-time Medical Director. The not-so-large companies employ several nurses who work under the direction of a part-time and in some cases full-time physician. When more than one nurse is employed, we should find two levels of industrial nursing, the charge nurse and the staff nurse. Although this is not always the case, it is recommended for the most effective use of nursing time. Occasionally occupational health departments employ nurses who do home visiting. These companies are those which employ 500 or more workers, and they make up only 2% of all American industry. The other 98% falls into the small industry classification, and this group employs 54% of the labor force.[4] Here there is usually one nurse who covers the occupational health department for eight hours a day, for a five- or six-day week. In industries

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too small for a full-time nurse, the majority have no professional health service within the plant, but use the doctors in the neighborhood for emergencies too great for the first aider to handle. Nursing services are sometimes provided to workers in small industries through cooperative plans backed by groups of industries, insurance companies, labor organizations, health departments, and private physicians. These programs vary considerably. In some cases they offer the only practicable means of providing health services to employees of small companies. There are a few industrial nurses who work part-time for several small companies. Some visiting nurse agencies offer part-time nursing service to the smaller industries and a public health nurse spends from four to 25 hours a week in the plant giving nurse service.

All of these part-time as well as the full-time industrial nurse programs are covered by on-call or part-time physicians who may or may not report to the plant on a daily schedule. Unfortunately there are many nurses who have inadequate medical direction. This can seriously handicap the whole health program. Adequate medical supervision is essential for the nurse to function at her highest professional level.

It matters little whether there be one or many nurses; the scope and type of the industrial nursing program will depend on the nurse, her personality, her preparation for this special field, and the amount and kind of medical supervision she receives. When the physician is not on duty in the department, the nurse represents the health profession to the workers. She must make decisions that under any other nurse-doctor relationship would be the sole responsibility of the physician. It is the nurse who contacts the worker first and for the longest period.

In contrast to the past when industrial nursing was often thought of as first aid, the nurse in a great many industries has become synonymous with the occupational health department. The workers bring her their problems, big and small. Many of these problems are not connected with their job, and many of the ideas are not problems but joys and bits of personal information that the worker expects the nurse to want to know about. Industrial nursing is at its best when the nurse is interested in the worker, and when a close relationship exists between the nurse and the physician to whom she is legally responsible.

THE duties and responsibilities of industrial nurses are varied, but all give nursing care to workers with occupational injuries and illnesses and emergency care and referral service to these same workers for non-industrial health problems as authorized by her standing procedures. The nurse who has had post-graduate training that covers a working knowledge of industrial hygiene, occupational diseases, and compensation as well as the basic philosophies of public health and preventive medicine, is better prepared to function adequately in an occupational health department. Health education and health counseling require her to have a broad understanding of her community's health and welfare resources, knowledge of health education principles and methods. Most important of all, she must have an interest in and the ability to establish and maintain good human relations; it is essential that nurses connected with industry have knowledge of the whole person and the whole family of the workers for whom they have responsibility. If there is a top secret in this field of industrial nursing, this is it. No nurse, no program succeeds without this understanding of human relations.

Industrial nurses participate in the medical examination program, sometimes doing the routine testing and laboratory work. Many do the initial interview that establishes the purpose of the examination for the worker and obtains the health and occupational history for the physician. Here is one of the places where she must understand records and their value.

The organization and maintenance of a smooth-running efficient unit is also one of her responsibilities. She must have the ability to organize and an appreciation of business methods as well as being familiar with her company's policies, the product that it produces, and the hazards and problems involved.

Her assistance with safety and accident control depends on the size of the company and the number of people who make up the health team. In any case, the nurse can contribute to the safety program if she serves on the safety committee, and her written reports of both minor and major injuries are a source of information which permits objective study of the problem.

Keeping abreast of developments in science, industry, and her profession is another important aspect of the duties and responsibilities of the industrial nurse. She so often works alone and has so little opportunity to discuss developments with others. It is most important that she find the time to go to institutes and workshops as well as meetings of her professional organizations where these subjects are presented, and that she have the opportunity to broaden her professional understandings.

In addition to the nurses who work in the occupational health departments, there are industrial nursing consultants. These are employed in most cases by an insurance company or a state or Federal health department. Occasionally a visiting nurse association or a city health department has one as a member of its staff. The consultant can and should influence the level of efficiency of industrial nurses. It is imperative that the nurse hired for either a charge nurse position or an industrial nursing consultant position not only be a graduate of an accredited school of nursing with several years of experience, but also that she have post-

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graduate training in this special field of industrial nursing. The new nurse should turn to the consultant for direction, and the established nurse should find in the consultant a challenging, helpful colleague.

THE future of industrial nursing will depend on many things, but there are two factors that will greatly influence it. The first is that industrial nursing is a specialty, and special training in this field will better prepare the nurse to function adequately in it. The second important influence is that the nurse in industry is a professional person who can do a great deal, but only if her potentialities are recognized and utilized by both the medical profession and the industry employing her. The possibilities are endless. Industrial nursing is one of the most dynamic and challenging of all the areas of specialization open to the graduate nurse.

The programs for the big companies will continue. There will be more nurses working side by side with the other members of the occupational health team whose programs will stress prevention and will be planned to meet the total health needs of the workers. The number of nurses working for the smaller companies will also increase, probably at a much faster rate. It has been estimated that 18,000[5] nurses will be needed in the near future to meet the demands of industry. This whole problem of health services for small industry needs further study; the value of the well-trained industrial nurse to these programs has been established; the problem is what type of program, full-time, part-time, or cooperative, will best serve industry's needs.

The number of nurses has grown from one in 1896 to over 10,000 in 1950. The industrial nurse has emerged from an obscure place to a position of recognized essentiality. Her relationship to all personnel makes her the ideal interpreter of an occupational health program.

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Report of a Survey of Medical Services in Industry

ROBERT COLLIER PAGE, M.D.

THE five papers we have heard unquestionably bring us up-to-date not only in respect of the present-day concept of medicine as applied to industry in its broadest sense but also in respect of the role of each component of an industrial health maintenance team, management, the physician, the nurse, the industrial hygienist, the University.

Before asking for discussion, I shall present a statistical survey of the actual medical services of 100 leading industrial organizations in the United States.

CHART I.
MEDICAL SERVICE IN INDUSTRY SURVEY
IMPORTANT FEATURES

1. Medical Policy
2. Whom the Medical Director Reports to
3. Qualifications of the Physicians
4. Duty Hours of the Physicians
5. Scope of Service Offered
   - First Aid
   - Pre-placement physical examinations
   - Periodic physical inventories
   - Supervision of health, sanitation and industrial hygiene problems
6. Facilities for Complete Diagnostic Examinations
   - Personnel
   - Space
   - Equipment
7. Medical Records
8. Management's Attitude Toward the Medical Phases of Human Relations
9. Attitude of Management Toward the Medical Department
10. Attitude of Employees Toward the Medical Department

The majority of these organizations are personally known to the Trustees of the American Foundation of Occupational Health. The facts recorded are based on write-in surveys the complete analysis of which will be forthcoming in the near future. I hope that pertinent discussion will be provoked.

In analyzing the facts presented, particular attention was given to the subjects in Chart II.

This chart (II) will furnish an idea of the nature of industries considered in this survey. It is to be noted that the coverage is quite broad.

Chart III shows that of 100 companies surveyed, approximately 75% do have a regular written medical policy in effect. In the 17 companies employing over 20,000 persons, it is, with but one exception, the practice to have a written medical policy. It is surprising to note that a written medical policy is shown to be standard practice in 86% of the 1000 to 2500 employee companies, whereas only 65% of the next two groups do have such a policy.

Chart IV, analyzing the actual number of company physicians, both full and part-time, shows that in the first three groups the physician-employee ratio is considerably better than in the last two groups—1:1483 as against 1:2700. It is noted also that all but one company use the services of outside consultants.

Chart V, which shows the number of nurses employed, gives a ratio of 1:583 employees in the three lower employee groups compared with a ratio of 1:925 in the two higher groups.

Three-fourths of the companies reported having space and equipment sufficient for the performance of complete pre-placement and periodic

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CHART II.
NATURE OF INDUSTRIES

Chemical	11	Electric Lamps	2
Petroleum	6	Converters	1
Steel	8	Food	2
Paper	2	Explosives	3
Drugs	6	Metal	2
Automotive	4	Utility	3
Die Casting	9	Meat Packers	3
Electronics	2	Insurance	1
Research	2	Rubber	1
Holding Company	1	Textile	3
Printing	4	Refrigerators	1
Heavy Machinery	14	Aircraft	3
Engines	1	Shoe Manufacturer	1
Plastics	1	Electrical Supplies	3
	Total 100		

examinations (Chart VI). The remaining one-fourth were reported as equipped to provide first aid treatment, and a limited form of pre-placement examination, but were lacking in the complete medical equipment essential to performance of a proper periodic examination (e.g., lack of x-ray, EKG or BMR equipment).

Chart VII covers an analysis of the reports of 10 smaller companies employing less than 1000 employees each. Six of these companies have a written medical policy. The approximate ratio physician-employee is 1:345. Each company uses outside consultants, six have complete medical facilities, and all but one maintain complete and confidential medical records. Only one company Medical Department is directly responsible to management.

Although none of the companies has a separate industrial hygiene department, in only five do the Medical Departments have supervision of the industrial hygiene problems.

Review of the figures in Chart VIII shows that in most cases (81%) the Medical Department has either supervisory, or advisory, duties in connection with industrial hygiene problems of the industry concerned. It is noted that in the larger industries where greater departmentalization is expected, there is more likely to be a separate industrial hygiene department.

CHART III.
COMPANIES WITH STATED MEDICAL POLICY

Number of Companies	Group	Number of Employees	Stated Medical Policy	
			Yes	No
21	1,000- 2,500	38,562	18	3
30	2,500- 5,000	137,658	20	10
27	5,000-10,000	204,947	17	10
5	10,000-20,000	81,738	2	3
17	Over 20,000	488,108	16	1
100	Grand Totals	951,013	73	27

CHART IV.
NUMBER OF DOCTORS AND OUTSIDE CONSULTANTS

Number of Companies	Group	Number of Employees	Physicians*		Outside Consult.	
			F.T.	P.T.	Yes	No
21	1,000- 2,500	38,562	35	14	21	—
30	2,500- 5,000	137,658	70	26	29	1
27	5,000-10,000	204,947	108	48	27	—
5	10,000-20,000	81,738	23	3	5	—
17	Over 20,000	488,108	102	170	17	—
100	Grand Totals	951,013	338	261	99	1

*1 physician to 2,000 employees approximate.

CHART V.
NUMBER OF GRADUATE NURSES

Number of Companies	Group	Number of Employees	Graduate Nurses		
			Sup.	Staff	Vis.
21	1,000- 2,500	38,562	16	61	2
30	2,500- 5,000	137,658	21	198	3
27	5,000-10,000	204,947	29	323	—
5	10,000-20,000	81,738	10	96	—
17	Over 20,000	488,108	42	428	40
100	Grand Totals	951,013	118	1,106	45

CHART VI.
COMPANIES WITH MEDICAL FACILITIES AND MEDICAL RECORDS

Number of Companies	Group	Number of Employees	Facilities		Complete and Confident Medical Records	
			Complete	1st Aid	Yes	No
21	1,000- 2,500	38,562	17	4	21	—
30	2,500- 5,000	137,658	16	14	29	1
27	5,000-10,000	204,947	21	6	25	2
5	10,000-20,000	81,738	5	—	4	1
17	Over 20,000	488,108	17	—	17	—
100	Grand Totals	951,013	76	24	96	4

CHART VII.
TEN COMPANIES WITH LESS THAN 1,000 EMPLOYEES
Total Number of Employees: 5,183

Stated Medical Policy	Yes	6
	No	4
Physicians	Full-time	5
	Part-time	19
Graduate Nurses	Superv.	4
	Staff	16
Outside Consultants	Yes	10
	No	0
Facilities	Complete	6
	1st Aid	4
Medical Records	Yes	9
	No	1
Medical Department Responsible to	Management	1
	Personnel	4
	Others	5
Department Supervises Hygiene and Sanitation	Yes	5
	No	5
Separate Independent Hygiene Department	Yes	0
	No	10

CHART VIII.
INDUSTRIAL HYGIENE

Number of Companies	Group	Number of Employees	Department Supervises		Separate Department	
			Yes	No	Yes	No
21	1,000- 2,500	38,562	16	5	5	16
30	2,500- 5,000	137,658	26	4	4	26
27	5,000-10,000	204,947	25	2	2	25
5	10,000-20,000	81,738	4	1	1	4
17	Over 20,000	488,108	10	7	13	4
100	Grand Totals	951,013	81	19	25	75

Chart IX shows that, of the 100 companies canvassed, in only 38% are the Medical Departments responsible directly to management (the Board), while the remaining 62% are responsible to another department (Personnel, Employee Relations or Industrial Relations). Further comments on this particular subject will be made later.

Chart X shows a breakdown of the number of companies surveyed and the number of their employees. Below these figures appears a break-

down analyzing certain information by Medical Departments which report directly to management, as well as those which report to another department in the organization. These figures

CHART IX.
TO WHOM ARE MEDICAL DEPARTMENTS RESPONSIBLE?

Number of Companies	Group	Number of Employees	Medical Department Responsible to: Management	Personnel	Others
21	1,000- 2,500	38,562	9	3	9
30	2,500- 5,000	137,658	13	14	3
27	5,000-10,000	204,947	10	15	2
5	10,000-20,000	81,738	—	4	1
17	Over 20,000	488,108	6	3	8
100	Grand Totals	951,013	38	39	23

are self-explanatory, and it is easily seen that those Medical Departments reporting directly to management (Board) reveal a greater acceptance, or awareness, of the present concepts and principles of medical service in industry.

As mentioned, the true statistical analysis of this study is as yet incomplete. Nevertheless, I believe the findings to date as I have presented them offer some idea as to the present state of affairs of Medicine in Industry as applied to a comprehensive cross-section of American industry.

CHART X.
ANALYSIS OF SURVEYS ACCORDING TO WHOM MEDICAL DEPARTMENT REPORTS

Companies Surveyed: Number	Employee Group	Total Employees
21	1,000- 2,500	38,562
30	2,500- 5,000	137,658
27	5,000-10,000	204,947
5	10,000-20,000	81,738
17	Over 20,000	488,108
100	Totals	951,013

	Med. Dept. Reports to: Board	Other
Has a Stated Medical Policy	82%	69%
Medical Personnel—Physicians*	1:1400	1:1729
Medical Personnel—Regular Nurses	1:778	1:774
Medical Facilities—Complete	87%	69%
Complete—Confidential Records	100%	93%
Supervision of Industrial Hygiene	89%	76%
Separate Industrial Hygiene Department	16%	31%

*Full- and Part-time.

The American Foundation of Occupational Health is at present searching for a yardstick by which to gauge the standards of medical service for industry. Its Trustees wish to be in a position to advise the profession and business alike, not only as to the present status of their own medical organization in terms of what is considered practical and efficient for their specific needs, but also constantly to be in a position to advise them as to current trends in this active medical phase of human relations.

Discussion

ROBERT C. PAGE, M.D.: There has been one weakness in this panel. No one was included to discuss the viewpoint of labor. Is there anyone here who would like to give us his views.

FRANK P. GUIDOTTI, M.D.: I represent labor but not labor alone; in fact, I represent both labor and management. In New York City we have a unique set-up, called the Health Center, for the medical care of 36,000 employees in the hotel industry. This is sponsored by management; the employee does not pay anything for his medical care. The entire program is supervised by the combination of 10 directors from labor and 10 directors from management. It works very well. The employees appreciate our type of medical service. The organization itself is a non-profit one. Pre-placement and periodic examinations are performed. Our ambulatory services are tops. All of the physicians and nurses are well-paid for their time. In the first year we had approximately 10,000 permanent employees come to the Health Center for examination.

MORRIS A. BRAND, M.D.: As Medical Director of the Sidney Hillman Health Center of New York, I believe I have the unique distinction of being one of the relatively few administrators in this country who is administrating what amounts to a "pure" labor medical program. I use the word "pure" because, although management and labor participated in raising the funds to purchase, renovate, furnish and equip the Sidney Hillman Health Center, *only* labor (the members of those unions affiliated with the New York Joint Board) has been providing the finances to operate and maintain the Center.

Labor is people. Labor wants to improve its standard of living through better hours, better homes, better educational facilities, better working conditions. The latter include better health. We have heard the various speakers point out that managements are interested in improving the health and well-being of their employees. Here, therefore, is a mutually accepted area of understanding—not new—but definitely here to stay, and to expand. Labor and management see eye to eye on the value of better health to the workers. There is no difference of opinion on this point. May I add that, as a novitiate in the IMA (my first meeting, and two days after election to membership), I have been greatly impressed with the sincerity management has and is continuing to manifest in better industrial medical practices. I intend to take back my observations to the New York Joint Board of the Amalgamated Clothing Workers of America, and point out that this is another evidence that management and labor have a common ground in building a better America—the healthy worker.

I would like now to offer several comments arising from my unique status. One is that the President of the New York Clothing Manufacturers' Exchange, at the first annual meeting of the Sidney Hillman Health Center Board of Directors, indicated that the manufacturers will be glad to participate through an employer contribution in the operation and maintenance of the Center, so that the present practice of charging nominal fees for laboratory, x-ray services, and physical therapy will be discontinued. This remarkable offer was made in the face of a severe downward deflection of the men's clothing industry.

Another important relationship of this Center in the future will be to develop and integrate with

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the Center's activities the in-plant medical services found essentially in the larger companies, and to encourage and assist the organization, on some group-basis, of in-plant medical services in the small shops.

The Center has incorporated in its program a referral service for the medical profession. We provide the local family physicians with clinical summaries, laboratory tests, x-ray examinations, and consultations with our specialists in accordance with the physician's requests. Hundreds of such reports have been sent to physicians in the Center's first year of operation.

OTTO P. GEIER, M.D.* I do not know that I can add anything to these fine papers. The one thing in my consciousness since their beginning is that there must be some way found for the physician, no matter how big the plant, to get close to the men. They must learn what his relationship is to them and to the corporation. In my particular instance, many years ago I found it of great advantage to begin my service by getting together the so-called Employee Service Committee which had to do with mutual aid and other functions in which they were interested, and sit down with them and carefully go over one subject after another. That was slow work but it finally brought them the consciousness that I stood for the worker first and management second. It is my belief that if something is good for the employees, it is also good for management.

Hearing these splendid papers, I am again impressed with the wonderful progress that has been made. The material and knowledge developed and evolved through this organization for the benefit of employees and the country at large are of great importance. Unfortunately, neither management nor the public is aware of the facts and knowledge we exchange behind closed doors. The public and the profession—and let me emphasize the profession, namely, the American Medical Association above all groups—need to appreciate and acknowledge the value of preventive medicine as it has grown up in industry.

Managements were not friendly to us in the beginning. They are now gradually approaching us, to listen and learn. The great progress that comes out of these meetings is the published record of the many papers presented.

One of the things I might suggest to young men as well as to management is that they keep in close touch with outside physicians and organized community associations. For example, here in Cincinnati we have a splendid organization known as the Health Federation which deals with community problems. Thus, all of the facilities of the community are operated for the benefit of all employees.

I can well remember the early years, when it was not respectable for a physician to go into industrial medicine. Today it is different. Nevertheless it is still of paramount importance that more progress be made in bringing to the consciousness of industry and the medical profession the value of industrial medicine. I think there is little appreciation in the average mind of the average doctor of what industrial medicine actually is, and how it contributes to research and definitive medical knowledge which might never have developed without the recognition and use of physicians in industry.

ROBERT C. PAGE, M.D.: I would close this panel discussion by saying that it is now evident that a Medical Department in industry, with all of its benefits, holds an enviable position in company affairs today. It is a service unit—of service to employer and employee alike. Its activities are in the neutral zone between management and labor, with equal interest in both. Medical service in industry, whether good or bad, attracts. When it is good, you can not stop it. This is to the mutual benefit of all concerned.

*OTTO P. GEIER, M.D., is one of industrial medicine's Elder Statesmen. His identification with this field began nearly 40 years ago, when he became Director, Employees' Service Department, Cincinnati Milling Machine Company, in charge of labor relations and employee medical matters. "Who's Who in Industrial Medicine" notes that he is "distinguished for pioneering work in the organization of medical services in industry, and the coordination of Personnel, Medical, and Safety Departments." Throughout his long career he has always been a forthright and forceful champion of industrial medicine as an individual and special field of practice. He was one of the organizing group of the American Association of Industrial Physicians and Surgeons (now the INDUSTRIAL MEDICAL ASSOCIATION), and in 1921-'22 he was the Association's President.

The Master

FROM James T. Fisher's and Lowell S. Hawley's "A Few Buttons Missing" (published last year by Lippincott): "If you were to take the sum total of all the authoritative articles ever written by the most qualified psychologists and psychiatrists on the subject of mental hygiene—if you were to combine them and refine them and cleave out the excess verbiage—if you were to take the whole of the meat and none of the parsley, and if you were to have these unadulterated bits of pure scientific knowledge concisely expressed by the most capable of living poets, you would have an awkward and incomplete summation of the Sermon on the Mount."

—FREDERIC BABCOCK, in *Chicago Tribune Book Section*, May 4, 1952.

Traumatic Vasospastic Disease of the Hand (Raynaud's Phenomenon)

EARL F. HOERNER, M.D.
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VASCULAR disturbances resulting from the handling of mechanical devices have been recognized since 1911, when the first report on pneumatic hammer disease was made by Loriga[1] in Rome, in which he described a case following the use of a pneumatic tool. The first report of peripheral vascular manifestations following the use of pneumatic tools in the United States was by Cottingham in 1917[2]; his investigation was made at the request of the Journeyman Stone Cutters' Association on men using the pneumatic chisel in the Indiana limestone belt. At this time there was much agitation against the use of pneumatic tools by the workers in this area, and, as a result, the U.S. Bureau of Labor Statistics and the U.S. Public Health Service became interested. In their behalf, Dr. Alice Hamilton was sent to Indiana to study the problem, and her report was published in 1918.[3] Since that time there have been many reports on this vascular condition, but none has described the clinical findings as completely. Pneumatic hammers and chisels were blamed for most of the cases of this phenomenon until 1945, though Middleton[4] in 1930 observed Raynaud's phenomenon in men exposed to intense vibrations while working at "pounding-up" machines in the boot and shoe industry. Up to 1945, it had been recognized that the harmful processes were those which subjected the worker's hands to repeated hammer blows, and there was much debate as to which were the most harmful tool speeds, although, in 1918, Leake[5] had estimated the primary vibrations from limestone cutting tools at 3,000 to 3,500 per minute with subsidiary vibrations up to 10,000 per minute. Subsequently, articles published by various authors until the year 1945, incriminated various and different tool speeds, without definite evidence to support their statements. No other mechanical tools had yet been found harmful.

During the past 10 years, and particularly during the recent war, the clinical effects of vibratory tools, with clinical manifestations similar to those originally reported by Hamilton in 1918, have become more pronounced which is not surprising in view of the widespread use in modern industry of machines which produce noise and vibrations, and the demands for ever-increasing output. Telford[6] and others in 1945 discussed Raynaud's phenomenon occurring in those who handled portable grinding tools. Agate, Druett, and Tombleson[7] in 1946 reported it occurring in those who ground small iron castings against large grinding wheels. In this instance there was no vibrating tool, but the castings were firmly held in the fingers and vibrated while being ground. In 1945 Gurdjian and Walker[8] added to the earlier reports on pneumatic tools a series of six cases of Raynaud's phenomenon occurring in those who had used a light portable riveting hammer in one hand while they steadied the material to be riveted with the other hand. It is now generally recognized that vibrating tools are the etiological factor in the production of these clinical manifestations; and Agate and Druett[9] in 1947 conducted a controlled laboratory study to demonstrate the relationship between vibrations as produced by tools used in everyday industry and the clinical syndrome which is caused by their use.

The Vibrating Tools

THE industries in which vibratory tools are now employed are numerous and increasing. These include mining, quarrying, road making, shipbuilding, locomotive and other workshops, airplane construction, shoemaking, and all types of construction work. The tools used in these industries fall into two classes regardless of their motive power. In the first class are those which depend for their effectiveness upon the to-and-fro motion of a piston. The majority of compressed-air tools are of this type, for example, rock drills, road rippers, mechanical picks, riveting, chiseling and chipping hammers, and pounding and lasting machines. In all these types, a succession of hammer blows is the method of work, and vibration is inevitable. Moreover, the vibration is not so much a continuous oscillation as a series of short pulses with relatively long pauses between them. The second group of tools comprises those which rotate and are held in the hands, such as grinding and polishing equipment, most of which depend on electricity for their motive power. Vibrations are not essential to the effective working of these tools; the better they are made, the less chance there is, although, when they are used for grinding purposes, vibrations are inevitable. The weight of these various tools varies from one and one-half to 50 pounds or more. Walker and Gurdjian[10] reported in 1948 that the vibrations from these machines ranged from 600 to 50,000 or more per minute.

This wide range of vibrations from mechanical devices now commonly used prompted Agate and Druett in 1947 to make a closer study of the vibrations produced in industry. They stated that, besides the frequency, it is necessary to study the amplitude and form of the vibrations, and to recognize that few vibrations, except in the simplest kind, are in the form of pure "notes" depictable graphically as sine

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wave curves. Most have complex wave forms which can conveniently be expressed in terms of a fundamental frequency of large amplitude, upon which are imposed harmonics of progressively higher frequency and smaller amplitude. A tool may be said to have a speed of so many strokes or revolutions per minute (rpm). This figure will determine the fundamental frequency of the vibration, but it is not justifiable to assume that this always is the damaging one. It is already recognized that the biological effects of high-frequency sounds, or high-frequency alternating currents, are different from those of lower frequencies. Agate and Druett in 1946 devised a method for rapidly recording vibrations in terms of the frequency and amplitude of all the individual harmonics. The method depends upon placing a crystal pick-up on the vibrating surface and putting the electrical response which it generates through a series of filters, so that the fraction in each frequency band appears quantitatively upon a fluorescent cathode-ray screen and can be photographed and measured. This analyzing instrument is an adaptation of the acoustic spectrometer. This method and technique can be used for any sort of vibration changes from moment to moment. By this method and comparison with clinical data it is felt that vibrations of large amplitude between the frequencies of about 40 and 125 cycles per second, 2400 to 7500 cycles per minute, are concerned in producing Raynaud's phenomenon, with the most common range of 3000 to 3500 vibrations per minute.

Vibrating tools are used in various ways. Small riveting hammers used in riveting airplane parts are held in one hand while the tool is directed by the other hand. In some operations the object to be riveted is held in one hand and the riveting hammer in the other. In mining operations, the pneumatic drill is held at waist height or above the head, and by both hands. In breaking pavement, the pneumatic hammer is held below the waist and in both hands. In small grinding or polishing operations the tool may be held in the hand by a "pencil grip." The method or technique of holding the tool and doing the polishing, riveting, grinding, or pneumatic-hammer work, has a definite effect on the predisposition to, occurrence of, and site of, the vasospastic disease.

Effects of Use

IT IS NOW recognized that Maurice Raynaud included among the cases he described in his thesis of 1862 examples of several different diseases in which the same manifestations had appeared. At the present time it is usually accepted that the term "Raynaud's disease" shall be used only for a distinct but rare symmetrical vascular disorder, of unknown etiology, which is found mostly in young women; similarly, that "Raynaud's phenomenon" shall apply to a symptom or sign, namely, intermittent pallor or cyanosis of the extremities. Raynaud's phenomenon is defined as "intermittent pallor or cyanosis of the extremities precipitated by exposure to cold, without clinical evidence of blockage of the large peripheral vessels." Agate[11] in 1949 proposed that from this time on, all vascular disorders of the type under review, caused by the use of vibratory tools in industry, be included under the single diagnosis of "Raynaud's phenomenon of occupational origin," and that other synonyms commonly used, such as "white fingers," "traumatic vasospastic disease of the hand," and "dead hand," be dropped from the literature and clinical notes.

The diseases produced by vibrating tools may be divided into the following clinical types: (1) Raynaud's phenomenon of occupational origin; (2) involvement of the bones, joints, and muscles of the upper extremities; and (3) a neuritic form. Attacks of the vasospasm in the fingers are the most commonly recognized after-effect of the use of vibratory tools. Bone and joint and muscular involvement includes arthritis of the elbow, degeneration of the carpus, tenosynovitis of the hand, and thickening of palmar aponeurosis. The neuritic form of the disease is characterized by pain in the affected extremity and dysfunction of the median and ulnar nerve distribution of the hand in the form of hypesthesia and atrophy of the muscles supplied by these nerves. It is usual for these types to occur as clinical entities, although combinations of two or more types are seen frequently. However, it is not within the scope of this paper to discuss the conditions of bone, joint, muscle or nerve involvement, but that of the occurrence of peripheral vascular disease which exists as a definite clinical entity and has been defined as "Raynaud's phenomenon of occupational origin."

The clinical pattern of traumatic vasospastic disease of the hands is almost stereotyped. After a few months to several years of exposure to the vibrations, the patient notices attacks of blanching and numbness of the fingers. The pallor is much more pronounced than in Raynaud's disease, but it is not followed by the stage of extreme asphyxia so characteristic of the true Raynaud's disease. It is not symmetrical even when in both hands. It is more common in the left hand in right-handed persons, because the tool is held in the left hand with the cutting edge pressed against the object, or the object to be riveted is sometimes held in the left hand, while the handle of the machine is held in the right hand. Therefore more vibrations per period of time are transferred to the left hand, with the resulting earlier occurrence, and more severe clinical signs, found in the left hand. The little, ring, middle, and more rarely the index finger of the left hand and the tips of the fingers of the right hand are usually involved. However, in left-handed persons, the condition of the two hands is reversed. In this connection

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Hamilton noted that the front of the tool was grasped tightly by the guiding hand. At the time of the blanching and numbness, physical examination will reveal the color change, some clumsiness and some loss of perception of pain, heat and cold, especially during the early period of the blanching. Of particular interest is the fact that pain is not a prominent feature except during and immediately after the vasospastic attacks. These attacks may occur while the person is working. Usually the blanching is most pronounced early in the morning, particularly in cold water. The attacks can be brought on by washing the hands in cold water or going outdoors for a while in cold weather. These attacks usually occur more often in the winter months when exposure to the cold is more likely. Emotion does not appear to produce the attacks. Some workers have complained that if they hold their hands up for a few minutes the affected fingers grow numb. In addition to the blanching and numbness, most patients complain of a discomfort in the hands following and during the attacks. In some instances this discomfort was described as "toothache-like" in quality, and persisted for a few minutes after the ending of the attack. The attack could usually be terminated by entering a warm environment, or by application of heat, and this would be followed by flushing of the affected fingers and a "pin-and-needle" sensation. In the six cases reported by Gurdjian and Walker, on response to cold air, particularly in the morning, the involved fingers became white, and painful. With warming, the finger changed to bluish-yellow and then to pink, and soon the vasospasm was followed by vasodilatation. Between attacks, the hands were normal, and the episodes were not all of equal severity, one or more phalanges being involved at various times. In all reported cases, between periods of attack the fingers appeared normal, the nutrition of the fingers remained good. Gangrene and scleroderma do not accompany this form of vasospastic disease of the fingers.

In Hamilton's study, reported in 1918, a study of 67 men with Raynaud's phenomenon, the length of experience with the pneumatic hammer ranged from one and a half to 16 years. The average time among those who were affected was 5.7 years. The average working duration among the employees who reported that they had not been affected injuriously was 9.2 years. Hamilton found in this same study that, of 38 limestone cutters, only four escaped having the disorder. In Gurdjian and Walker's report, of six women who used a rotary riveter, the time between the onset and beginning of use of the vibrating machine varied from two to 11 months, the average being eight months. Does this signify that women have a greater predisposition to this disorder?

Dart in 1946,[12] reported on a group of 109 patients of both sexes, where the duration of work with a vibratory tool prior to onset of symptoms ranged from one week to 30 months, and the median time was eight months. In another report, by Agate in 1949, in an airplane factory in England, a study was made of as many as possible of those who were using a rotating polishing tool, or who had recently given up using it. A total of 293 workers were seen, of whom 47 were women. Every subject in this study was asked to give a full occupational history from the time of leaving school, so that any who had previously used pneumatic hammers or had done polishing or grinding work were excluded from the study. A general medical history was taken and an examination was performed, in order to try to rule out etiological factors others than those of the present occupation. Finally, as a clinical step, the cold immersion test was used, which consisted of the individuals sitting with their hands and arms immersed to the elbow in water of 15° C, remaining in this water for 15 minutes. After this period of immersion, the hands were dried and examined for visible evidence of color or temperature changes. Dart stated that the immersion test, direct chilling of the hands, gives an almost quantitative measure of vascular tone, and the degree of vascular tone present appears to be the most sensitive indication of the extent of the pathologic changes. Of the 246 males in Agate's study, 13 were excluded because of previously working in an occupation with vibratory tools. Of the remaining 233 males, 163 (69.9%) were judged to be suffering from attacks of Raynaud's phenomenon. Of the original 47 women in the study, two were excluded because of previous occupational history of working with vibratory tools. Of the remaining 45, 21 (47%) were judged to be suffering from attacks of Raynaud's phenomenon. These figures suggest that among those exposed to the risk, the incidence of Raynaud's phenomenon was 184 cases out of he 278 persons, or 66.2%. In every one of these cases the vascular disorder had first appeared after using the portable tool in question. Agate states that without doubt, therefore, it should be considered of occupational origin. In the same report, Agate says that the average time elapsing between the start of the men's work with the vibratory tools and the first appearance of symptoms was (for the 163 affected men) 23.5 months, but there were wide variations from a minimum of two months, to a maximum of four years. The average time in the cases of the affected women was 20.6 months, and the limits were eight months to 45 months. Thirty-three of these men and women had already suffered their first attack before they completed a year of work in this factory. Other authors have reported that the duration of time between exposure to this industrial hazard and the occurrence of the first symptoms varies from one month to 20 years, with women having a greater predisposition to

the vasospastic disorder, as reported in the studies of Gurdjian and Walker, Agate and Dart.

Agate felt that it was necessary in this study to determine the age distribution for both the affected and unaffected workers in the airplane factory, lest this factor have a bearing on the case incidence. However, the age distribution is fairly comparable in the affected and unaffected group. He also states, that this vascular disorder due to the use of this particular tool, rotating polishing wheel, is not confined to any particular age group, since there is not found the largest incidence or greatest prevalence in the older workers, as would have been expected had this disorder been directly related to the progressive vascular changes of the advancing years. The distribution of cases by age and duration of exposure to risk before the onset of symptoms, is also interesting, as reported by Agate. Agate's study revealed a fair uniformity of distribution in four age groups, 20-29, 30-39, 40-49, and 50 and over. In the age group 40-49, where the majority of these cases occurred, the greater number were in the exposure-period 19 to 24 months, and were therefore scattered around the mean exposure period for the entire group, men and women alike. His data would also suggest that when age is to be compared with severity of the disorder, the effect of length of exposure can reasonably be ignored. The converse also appears equally true.

Diagnosis and Prognosis

WHAT happens to, and what is the prognosis for, the workers who develop this vasospastic disorder, in industrial work? It was Gurdjian and Walker's conclusion that, upon the first manifestation of the syndrome, the worker should discontinue his exposure to vibratory tools, and that the resultant disabilty may be compatible with the continuation of one's occupation. In others, recovery may result when use of the tools is discontinued, and, in still others, the disease manifestation is a condition to be reckoned with for the rest of the individual's life in spite of efforts to eradicate it. Agate studied the course and incidence of this phenomenon two and one-half years after the conclusion of his original study of 278 workers in an airplane factory had been completed. He was able again to interview 67.9% of the original group. A small proportion were still without symptoms, but others, previously normal, were now suffering attacks. It was estimated that between 77.3 and 90.3% of the original 278 had now become affected by the disease. In 11 cases the first symptom had been noticed after exposure to vibration had ceased. Half of those who had been affected in the first study were of the opinion that their condition was stationary; 36% claimed that there had been deterioration in the interim; while 4.9% stated they had improved. In spite of small improvements in some of these cases, the anatomical extent had, in the main, increased. Hamilton reported instances where vasospastic disease and attacks occurred 10 years after the discontinuance of the use of the pneumatic hammer.

The disability caused by this vascular disorder is hard to assess. This is not the well-recognized common type of disability seen in occupational cases, where there is loss of an anatomical part, or loss of time from work of relatively long duration, or permanent disabilities which vary little from hour to hour or day to day. Raynaud's phenomenon does not necessarily prevent a man from continuing in the same work, even though he may be advised against it. When the disability does occur it is transient, being present one moment, and relieved the next; also, it is dependent upon external factors, such as season, climate, and room temperature, as the presence of cold usually precipitates the attacks. However, various authors report loss of time from work as a result of vasospastic spells. This loss of time may vary from minutes to hours, during which the patient may rub, blow upon the fingers, do various exercises, or immerse the hands in warm water to try to alleviate or overcome the attacks. In Agate's study in 1949, of the original 278 persons, 65 were considered to be occupationally disabled. Claims for disability from this vascular disorder have been filed through the Workmen's Compensation Bureau, and have been listed as a hindrance to effective working in certain specified jobs. The high incidence of the disease among those exposed to the risk in the past 10 years leaves no doubt that the disability is far greater than we have clinical records or statistics to prove at this time.

Mechanism of Production

THE mechanism of production of this clinical picture as yet has not been clearly delineated, but several hypotheses have been advanced. Certain factors definitely are known to be of importance in the development of it. It is widely held that arterial spasm is the cause of the disorder, and that it may vary from site to site in different and subsequent attacks in the same individual. However, what causes the vasospasm and where it anatomically occurs is the clinical problem. Some authors claim that the involvement of the palm and metacarpal-phalangeal articulations, suggests spasm in the arteries proximal to the digital vessels. Hines and Barker[13] in 1944 published an arteriogram of the hand in a pneumatic tool worker who suffered from this disorder in which occlusion of the ulnar artery is clearly demonstrated. Gurdjian and Walker in 1945, performed biopsy studies and microscopic examination of tissue of five women. This study of the finger tissue showed no change in the structure of capillaries and arterioles, as no evidence of occlusive phenomena, proliferating intimal changes, or inflammatory reaction could be demonstrated. There is some question whether

the condition is fundamentally peripherovascular or primary neuropathic, with only secondary evidence in the vascular system manifested by local vasospasm. Hamilton advanced the theory that the disorder was caused either by the low temperature of the environment in which the vibratory tools were used, or anemia of the tissues of the hand and fingers from holding the tool too tightly and for too long a time. Gurdjian and Walker in 1945 proposed that the phenomenon was caused by injury to the myoneural junctions of arterioles in the fingers, disturbing fine mechanisms of chemical adjustment, with resultant loss of vasomotor control. With injury to the myoneural junctions, the blood vessel wall may react to cold with greater vigor than would arise under normal circumstances. Following this resultant vasospasm, there is usually a more than normal response so that the vessels are more dilated than ever, furnishing the typical clinical picture of the disorder. This injury of the myoneural junction may be of the nature of alterations in proteins, as is seen if solutions of proteins are exposed to high-frequency vibrations in vitro (ultra-sonic vibrations). Gurdjian and Walker in 1948 advanced another theory that the vasospasm was the result of a reflex mechanism, acting through the spinal cord. There is probably local injury to muscles, bones, and nerves, and this results in internuncial irritability in the connections between the afferent receptors in the spinal cord and the sympathetic efferent cells in the anterolateral column of the gray matter of the spinal cord. Upon the exposure to a cold environment, the sympathetic nervous system, in an effort to control vasomotor function of the entire body, produces increased local vasospasm in the affected hands and fingers. Factors which from previous studies are definitely known to be of importance in the development of this disease state are sex, manner in which the vibratory tool is held, exposure to cold, vibration of the tool by using "out-of-true" heads or defective parts, and use of vibratory tools on operations which are heavier than those for which they were designed. The heavier a tool is in relation to the work to be accomplished, the less it will vibrate, and the less the rate of vibration. The rate of vibration governs in part the type of disease encountered. Vibrations between 2,000 and 3,500 per minute are the most common in producing vasospastic disease of the hands; below 1,500 vibrations per minute, osteoporotic and arthritic conditions are common, and over 5,000 vibrations per minute, neuritic changes are expectable but do not occur with frequency.

Prevention

SOME procedures and precautions applicable in the prevention of this disorder are now mentioned: (1) frequent changing of jobs so that no one is exposed to vibrations for many days in succession; (2) the use of mechanical means of holding the tool and object; (3) the use of other than pneumatic or electrical tools to bring about the same operation; (4) greater care in the management and selection of personnel with particular reference to the female, and to persons who have a predisposition to disturbed vasomotor control as can be determined by specific laboratory procedures; (5) elimination or reduction of exposure to cold in working environment; (6) reduction to exposure of vibrations by insulation and absorbent material; (7) selection of proper tool for the operation; (8) preferred methods for the holding and positioning of the vibratory tool.

Comment

A DESIRABLE study or series of studies should be directed to provide further insight into this vascular disorder through controlled experiments with laboratory animals to determine if possible the etiological cause of, and the pathological mechanisms which, if found, would complete the true epideminological approach to, and control of, this affection of industrial workers. Does the disorder result solely because of one or a group of environmental factors, cold, vibrations, position of holding the tool, or is it aided by an inherent predisposition in the workers which aids, brings out, and makes clinical, the picture of Raynaud's phenomenon?

Summary

DURING the past 10 years, there has been a definite increase in the clinical manifestations of "Raynaud's phenomena of occupational origin." This has been defined as "intermitted pallor or cyanosis of the extremities precipitated by exposure to cold, without clinical evidence of blockage of the large peripheral vessels," and has been caused by the use of vibrating tools in industry. The reasons for these increases are the numerous industries in which vibrating tools are employed, and the ever increasing use of tools in which vibrations is a primary function of their operative use, such as riveting, chiseling, or drilling, or the vibrations are caused secondarily in industrial operations such as grinding and polishing procedures. The vibrations which are produced are composed of a fundamental frequency of a large amplitude which is determined by the strokes or revolutions per minute of the tool, upon which are superimposed harmonics of progressively higher frequency and smaller amplitude. It has been determined that frequencies of 2400 to 7500 cycles per minute are concerned with producing this occupational disease, with the most common range between 3000 to 3500 cycles per minute. The influence of sex and age of the injured worker, position and method of holding the tool, and environmental stresses of cold and humidity have been discussed, with particular emphasis on the increased incidence of this disease in women workers. The problem of evaluating the

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extent of disability for workmen's compensation cases has not been determined as yet. No previous criteria have been established for this type of disease, in which the attacks occur sporadically and infrequently, but still constitute an employment and/or employable problem. Prevention should play a large part in the management of this condition, and factors which should be taken into consideration are proper choosing of employees, utilization of proper tools for the job, and prevention of exposure by mechanization of industrial procedures. Several hypotheses have been advanced for the mechanism of production of this pathological picture, and it would appear that a future laboratory study under controlled conditions would aid in helping to clarify this purely theoretical knowledge of the disease.

(254 N. Craig St.)

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Government on Trial

THE DIFFERENCE between a statesman and a politician should be kept clearly in mind. A politician is a man whose ego has convinced him that it would be a public calamity for him to be defeated for office and that it is far better for the country that he compromise with his conscience occasionally and do the bidding of a pressure group lest the Congress be so unfortunate as to be deprived of his services. A statesman is a man occupying public office who thinks there are many worse things in the world than being defeated for re-election and who, therefore, is ready to stand up for the principle of what he knows in his heart is best for all the people rather than for a particular group which could help him win re-election. When the time comes that members of Congress generally are willing to face defeat while defending the principle of "equal rights for all and special privileges for none," something surprising will happen. It will be the almost automatic re-election of such men by overwhelming vote. And if by chance here and there some are defeated at the polls through the mistaken judgment of an uninformed constituency, something else surprising will happen. The individual will find in the triumph of his own conscience over selfishness and self-service a compensation so great that it will remain a precious heritage to him and his family for years to come, erasing the disappointments of defeat. Wartime affords a God-given opportunity for all manner of self-denial, including the sacrifice of misguided ambition for personal gain, for place, and for power in disregard of the national interest.

—From an Editorial titled "Just Yesterday," by DAVID LAWRENCE, first published in *U.S. News & World Report*, May 22, 1942, and republished in the same magazine, May 16, 1952.

INDUSTRIAL MEDICAL ASSOCIATION

The President's Page

AS GENERAL CHAIRMAN of the 1952 Industrial Health Conference and your new President, I believe I should make a report of the Conference to the many members who were unable to attend. It was a successful and outstanding meeting. The total registration was over 2000, which is the highest registration of any of our Conferences to date. It might be of interest to have a breakdown of those in attendance: Industrial Medical Association, 602; American Association of Industrial Nurses, 487; American Industrial Hygiene Association, 457; American Conference of Governmental Industrial Hygienists, 166; American Association of Industrial Dentists, 18; guests of all participating groups, 102; and exhibitors, 263. The commercial exhibits were of good quality and occupied all of the available space. It is readily seen that from the standpoint of attendance this meeting was most successful.

From all reports the scientific program was interesting and broad in its educational scope. The hospital clinics were excellent and were crowded to capacity. The joint programs with the American Industrial Hygiene Association and with the American Association of Industrial Nurses, and the Dentists were well attended and well received. One of the outstanding presentations was the panel on Medical Services in Industry. This emphasized the importance of the program which is being conducted by the American Foundation of Occupational Health. The medical and surgical sections were well planned and stimulating. The Program Committee of the Industrial Medical Association, under the leadership of Dr. Robert A. Kehoe, should be commended for the excellent program presented to the physicians.

There were many functions at the Conference not appearing on the program which were of great value to the Association. One of our most profitable meetings was the second annual breakfast meeting of the District Counselors and the Presidents of the Component Societies. This session started promptly at 7:30 A.M. and continued with great interest until almost noon. All of the counselor districts were represented except for district 20, Eastern Canada. All of the officers of the Association were present. Five component societies were represented. The Counselor reports with the resulting discussion and exchange of ideas will undoubtedly prove of value to our Counselors during the coming year. All agreed with our objective of gaining a thousand new members for the Association during the coming year, and, with the amount of enthusiasm displayed, we should reach our goal. The effectiveness of the District Counselors was so forcibly emphasized during this session, that the Executive Committee has agreed to increase the number of counselor districts. In this way the area to be covered by one counselor will be reduced, and his responsibilities may be executed with better results.

An innovation this year was a breakfast for the Committee Chairmen to meet with the Executive Committee of the IMA. This first attempt to have the Committee Chairmen together for a period of discussion proved to be of great interest. Each Chairman had an opportunity to report for his committee and to hear all of the other committee reports. The resulting discussion, exchange of ideas, suggestions, and clarification of committee assignments made this meeting very effective. The success and value of this function calls for a continuance annually. The strength of the Association depends to a large extent on the effort put forth by the various committees. Our present committee structure is so well planned and has functioned so effectively that there will be few changes during the coming year.

The Board of Directors meeting reviewed the Counselor and Committee reports. Much time was saved for the Board by having the two special meetings mentioned above. The Board approved the applications of new members. It reviewed and granted the Fellowships which had been approved by the Board of Examiners. Special attention was given to the granting of Honorary Membership to two of our members who had made great contributions to the field of Industrial Medicine over a period of more than 35 years. The Board reviewed the business of the Association for the past fiscal year and made some recommendations for the coming year.

The Annual Meeting of the members of the Industrial Medical Association had the largest attendance of recent years. This is an indication of the greater interest being shown by the membership of the Association. The President's and Managing Director's reports were presented to the members. The new method of electing Directors was used for the first time. This plan called for a list of 12 candidates to be presented to the members on a ballot, from which six were selected for the existing vacancies. This elimi-

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nates the criticism about the Nominating Committee electing the Directors. All 12 candidates were of such excellent caliber that the members had difficulty with their selections. The new Directors will have an opportunity over the next two years to make a great contribution to the Association. The real highlight of this meeting was the presentation of Fellowships to those individuals approved by the Board of Examiners and Board of Directors. So many questions have recently been asked in regard to Fellowship that this subject will be presented in detail in a future page.

Your President was privileged to attend the Past-Presidents' luncheon. It was an inspiration to see the sincere interest of these men in the present affairs of the Industrial Medical Association. This group included leaders of our Association from as long as 30 years ago. The true interest of these men is indicated by the fact that out of a total of 20 living Past-Presidents there were 14 present at the luncheon.

We should have no fear for the future of our Association when all factors of the 1952 meeting are considered. We are making progress. We must work together to elevate our Association to even greater heights.

E. A. Irvin, M.D.

ASSOCIATION NEWS

WESTERN INDUSTRIAL MEDICAL ASSOCIATION is the new name of the Western Association of Industrial Physicians and Surgeons. This change was made at the eleventh annual meeting of the Association, April 26, 1952. The officers and directors elected at that meeting are listed on page 8.

MICHIGAN INDUSTRIAL MEDICAL ASSOCIATION, on May 7, 1952, was adopted as the new name of the Michigan Association of Industrial Physicians and Surgeons. The officers and directors for 1952-'53 appear on page 6.

CHICAGO SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY is holding its annual meeting on Monday, June 16, 1952, at 8:00 P.M. at the Palmer House, Chicago. There will be a presentation by BURTON C. KILBOURNE, M.D., on "Primary Closure of Skin Defects: Indications and Technique"; and another by EMIL D. W. HAUSER, M.D., on "Disorders of the Foot Following Injury."

AMERICAN ASSOCIATION OF INDUSTRIAL NURSES, at the 1952 Industrial Health Conference, at Cincinnati in April, presented a testimonial, in the form of a small leather-bound book carrying the Association's tribute, to each of three physicians—CLARENCE D. SELBY, DANIEL L. LYNCH, and T. LYLE HAZLETT. The tribute was: "In recognition of the contributions which his knowledge and effort have made to the progress of industrial nursing, and as a remembrance from the members of this Association to whom his enthusiasm has even been an inspiration." Remaining pages carried signatures of members of the Association.

IN FLINT, Michigan, on May 7, the Michigan Association of Industrial Physicians and Surgeons (lately changed to MICHIGAN INDUSTRIAL MEDICAL ASSOCIATION), conducted its Third Annual Industrial Health Day. However, this Association is one of the oldest component societies of the INDUSTRIAL MEDICAL ASSOCIATION so that this "Third Annual" fails to reflect the Association's age. DR. O. J. PRESTON, of Flint, served as President, but, at the annual election he was replaced by the President-Elect DR. T. I. BOILEAU. Outstanding in the day's program were presentations by DR. G. J. CURRY and DR. E. A. OSIUS. At the annual banquet, DR. MAX R. BURNELL presented DR. A. C. IVY, Professor of Physiology, University of Illinois, who portrayed the "New Concepts of Artificial Respiration."

INDUSTRIAL MEDICAL ASSOCIATION recently conferred Honorary Membership upon A. GIRARD CRANCH, M.D., of New York City, and MAHLON R. SUTTON, M.D., of Flint, Michigan. DR. CRANCH was born in 1880 at Erie, Pennsylvania; attended University of Pennsylvania, 1899-1903; was graduated M.D. at New York Homeopathic Medical College and Flower Hospital, 1906; began his career in industrial medicine at Hammermill Paper Company, Erie, in 1909; became Medical Director, National Carbon Company, in 1919. He has been an IMA member since 1931, a Fellow since 1938. He was Secretary of the Association one term; a Director two terms. "Who's Who in Industrial Medicine" says of him that he is "distinguished for his studies of specific industrial hazards, and research in industrial hygiene and toxicology." He now is identified with the Industrial Toxicology Department of Union Carbide & Carbon Corporation, and engaged in research and consultation in industrial toxicology. DR. SUTTON was born in 1880; graduated M.D. in 1903 at Michigan College of Medicine and Surgery at Detroit. His IMA membership began in 1932, and continued through identification with the MICHIGAN INDUSTRIAL MEDICAL ASSOCIATION. He retired about four years ago.

LETTERS

Charles G. Farnum (1876-1952)

TO THE EDITOR: Charlie came up to Chicago one night in the spring of 1914 and joined Andrew Harvey, Wilbur Post, Tom Crowder and myself in a meeting in my office. It lasted late, and would that I had a transcript of that meeting! It was then that the idea of forming a National Association of Industrial Physicians and Surgeons was born. Charles Farnum was very active in this organization for many years. He was an inspiration to all of us. He was a born orator, writer and poet. Many of the spiritual ideas ingrained in our Association came from him. —HARRY E. MOCK, M.D.

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PRODUCT RESEARCH AND DEVELOPMENT

Articles selected for publication in this section of the Journal are related to commercial or prospectively commercial products and, by requirement, are written by physicians, represent original work not previously published, and have some flavor of newness. These articles are published so that newer products may become the recipients of further consideration and appraisal in the industrial medical field. The claims and conclusions of authors are not necessarily approved or accepted by this Journal.

EDTA in the Treatment of Lead Poisoning

ELSTON L. BELKNAP, M.D.
Milwaukee, Wisconsin

WITHIN the past few months much investigative work has been done on the use of EDTA or ethylene-diamine-tetra-acetate. This forms a stable compound with lead which is then rather promptly excreted safely in the urine to the amount of 50 or 60% within 48 hours, according to some recent experiments. Careful studies on animals have been done on this subject by Dr. Martin Rubin, of Georgetown University, a young scientist with whom I am personally acquainted and in whom I have great confidence. He is one of the first, with Dr. Harry Forman, of the University of California, who conceived the idea of clearing lead from the body in something of the same way that it and other heavy metals are cleared industrially from various solutions. I am aware also that Dr. Robert Bauer, et al., introduced by Dr. George L. Maison, Department of Pharmacology, Boston University School of Medicine, Boston, Massachusetts, gave a paper April 14, 1952, in New York on experimental work regarding calcium EDT used to protect chickens from experimental lead poisoning. Dr. Rubin reported his original results on EDTA 10 days earlier at a recent meeting of the American Chemical Society in Milwaukee during the week of March 31-April 4. Also, I have favorable information from him regarding the apparently successful use of this substance about a year ago in the case of a child who had severe lead poisoning with brain involvement. Since that time, I have had the opportunity to apply EDTA in the treatment of three industrial cases of severe lead absorption and intoxication. One was an instance of brain involvement or encephalopathy, one of lead colic and secondary anemia, and one without symptoms though with marked evidence of lead absorption and marked anemia. The types of lead exposure of these are interesting:

The first case, where there was definite brain involvement, was an accidental exposure for several months to inhalation of lead arsenate by a worker who baled scrap paper for a junk concern. Neither the worker nor the employer was aware that the dust evolved in great quantities as he tramped it down in the baler was a lead dust. Therefore he was not supplied with a respirator of any kind.

The second case involved a man who was cutting painted steel in repairing boats in a shipyard down deep in the hold, with no respirator or exhaust protection. This is a major type of lead exposure, brought about by the fuming of the lead with the burning torch.

The third case, who had rather marked anemia as well as heavy lead absorption, was a man who poured brass in a brass foundry without adequate protection from the inhalation of the lead fumes.

All of these cases had marked lead lines and stippled cells of more than 200 per 50 fields, the equivalent of 20,000 per million red cells. None required blood or urine lead determination to make the diagnosis once the gums and blood smears were examined. All three were in small plants, not under my supervision, where there was in fact no medical examination program of any kind. These are the situations and cases we use to demonstrate to our medical students.

Under treatment with EDTA all three patients have improved symptomatically. Their lead absorption has also improved objectively, as seen by disappearance of lead line, marked reduction of stippled cells, and sharp drop in porphyrin excretion. Moreover, the material is easily given intravenously and is not toxic, according to our hospital blood chemistry studies. Bone marrow studies will be reported on later. The quantitative study of lead in urine is somewhat complicated after the use of EDTA, because with this material the union of the lead and the chemical is so tight that special analytical methods have to be worked out. These are now being carried forward in Columbia Hospital laboratory, with the cooperation of Dr. Rubin. They will be reported upon later. Then I can pass a more considered judgment on EDTA. In the meantime, I believe that EDTA promises to be one of the most important discoveries in the treatment of lead poisoning since the use of calcium salts intravenously to relieve lead colic first reported in the outstanding 1926 monograph of Aub, Fairhall, Minot and Reznikoff.

NOTE OF WARNING: Since preparing the foregoing text, April 18, 1952, a further bone marrow study of one of my cases, on April 28, has

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been reported to me. This shows definite, though temporary, depression of the cellular blood-forming elements of the bone marrow. Whether this means that an overwhelming amount of the lead has been shifted from the large soft-tissue depots, such as liver and spleen, to the bone marrow trabecula, is as yet somewhat speculative. Re-check bone marrow study done May 15, 1952, 19 days after cessation of treatment, shows regenerative hyperplasia of bone marrow together with normocytic hypochromic anemia of lead intoxication. The fact remains that I do not believe that this material, EDTA, should yet be used to any great extent with adults. Certainly it must be used only in a teaching hospital where there is access to ample laboratory and hematologic study with bone marrow controls.

It may well be after future bone marrow studies on this and other cases are reported, that it will prove to have been a matter of temporary bone marrow suppression and that some reduction of dosage previously recommended may be sufficient to allow a wider use of the material. In any event, I still believe that EDTA is a really great contribution to the treatment of lead poisoning though its exact dose is as yet to be determined for the average adult case. One of our post-treatment cases had normal bone marrow.

For the child or adult, however, with the desperate complication of a lead encephalopathy, I believe we are justified in approving the use of EDTA even now.

Suggested dosages can be obtained from Dr. Maison, Department of Pharmacology, Boston University School of Medicine, Boston.

(231 West Wisconsin Avenue.)

Essentials of Medical-Nursing Services in Industry

THE following statement has been prepared jointly by the American Association of Industrial Nurses, the Industrial Medical Association, and the Council on Industrial Health of the American Medical Association to clarify legal and ethical principles of Medical-Nursing services in industry, both for members of interested professional organizations and for industrial employers providing any of the listed health services.

I. The value of physicians and nurses in industry depends upon:
   - A. Training, experience and aptitude.
   - B. A position of authority in the industrial organization.
   - C. Good rapport with workers.
   - D. Good relations with their professional colleagues.
   - E. Thorough knowledge of work environment and processes.
   - F. Effective use of community health resources.

II. A health service in industry should provide:
   - A. A safe and healthful work place.
   - B. Health counseling and health education.
   - C. Personal medical services as required for:
     1. Observance of laws, codes and health regulations.
     2. Emergency medical care.
     3. Health conservation.
     4. Job placement.

III. Personal medical services involving the establishment of a diagnosis and the definition of treatment or the performance of specific preventive measures are the function of the physician. However, it is desirable for the nurse to participate in such services if she acts under direct medical supervision, or under indirect supervision such as is provided by Standing Orders.

Standing orders are defined as a written compend of directions outlining services and procedures, approved and signed by a licensed physician, and acknowledged by him to be services and procedures that may be performed by a certain nurse under certain circumstances. Such orders should not attempt to delegate the exercise of medical discretion but should serve as authorization for approved routine procedures for common minor conditions; and as a directive for emergency care of more serious or complicated conditions, until the physician's arrival.

IV. In the absence of direct medical supervision the nurse should acquaint her employer with the legal and ethical scope of her services. She should at no time exceed the limits imposed upon her by training and licensure. If the nurse is asked to perform services exceeding her legal and ethical limitations, she should seek advice from the nearest official medical and nursing agencies.

V. In respect to industrial health services other than those listed as personal, the nurse can exercise considerable initiative. Practical limits must be based on her training, experience, and the availability of qualified consultants.

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BOOKS

In Small Plants

EMPLOYEE HEALTH SERVICE IN SMALL PLANTS. Industrial Health Series, Number 6, Metropolitan Life Insurance Company, New York, Pamphlet, paper bound, pp. 24, Free.

A COVER letter accompanying this pamphlet states: "This booklet, which outlines the establishment and operation of an employee health service in the small plant, is intended primarily for Metropolitan group-insured companies interested in setting up such a service. However, upon request and so long as our supply lasts, single copies are available for executives, physicians, and nurses of other firms."

The world of occupational health is populated, in general, by industrial physicians, industrial hygienists, nurses, and safety engineers who will never sleep well until procedures, practices, and organization are perfected whereby the multitudinous small plant is as well served in the protection of its workers as the large industry. This pamphlet provides no final word but is helpful along the way. In concentrated forms, consideration is directed to objectives and practices, personnel, space and layout, equipment, one floor plan, records, types of values, and an extensive reading list for more detailed information. This pamphlet is sixth in the Metropolitan series on industrial health. There may be reason to believe that this is the best of the lot.

Smog

AIR POLLUTION. Proceedings of the U.S. Technical Conference on Air Pollution, Sponsored by the Interdepartmental Committee on Air Pollution, Louis C. McCabe, Chairman. McGraw-Hill Book Company, Inc., New York, 1952, pp. 847, $12.50.

THE EVILS that are wrought in Washington seem to fall upon us apace. Much of the good seems to lag. So it is with this publication on Air Pollution which goes back to 1949, although the conference convened in Washington in May, 1950. Fortunately, in the long interim not all of the complexities of air pollution have been made simple. The contents of the new volume are as fresh as in 1950. The U.S. Technical Conference on Air Pollution, of which this book is the proceedings, was divided into seven sections: Agriculture, Analytical Methods and Properties, Equipment, Health, Instrumentation, Legislation, and Meteorology. Although this Journal is dedicated to the health of workers and much of this book is devoted to health, ever the reading of physicians should broaden into less specific territory. This being true, the items now to be mentioned are limited to other than the health of human beings. Thus, several authoritative papers, in engaging fashion, cover the "Effects of Air-borne Fluorides on Livestock," "The Atmospheric Pollution Problem of Mine Refuse Piles," "Air Pollution and Plant Life." If the little-thinking ones are unable to translate the implications of such papers into terms of human health, something is lacking. For example, air pollution from burning mine refuse piles may appear remote, but let it be remembered that from such "gob piles" emanate thousands of pounds of sulfur dioxide, hydrogen sulfide, and aldehydes. Vegetation will not grow; gardens become an impossibility; flowers are unheard of; painted houses turn black; metals are damaged. Almost at once the implications as to human health become apparent. And so throughout this massive book the ravages of air pollution and its direct and indirect impact on human beings' health and pockets come into evidence.

This publication is far broader in its coverage of air pollution than any other yet printed—but it's not all breadth. It has depth too.

The Merck Index

THE MERCK INDEX OF CHEMICALS AND DRUGS, 6th Edition. Merck & Company, Inc., Rahway, New Jersey, 1952, pp. 1167, $8.00.

THIS elaborate one-volume technical encyclopedia foremostly was not prepared for industrial hygienists—it has many applications. No less, the industrial physician and hygienist have long found preceding editions almost as indispensable as shoes or suspenders. Workers in occupational health function in two domains. One is the domain of the regular and routine—the control of known dusts, vapors, gases, etc. The other is the inevitable newness that so characterizes today's industry—new chemicals affording "surprise exposures." In all this newness, Merck's Index is likely to furnish the first lead—the initial information, the basic properties and uses. It is rare indeed to find chemicals new to industry that are not mentioned in any current edition of this Index. This new and enlarged edition follows the format of its predecessors. It briefly describes, through 1025 pages, chemicals and drugs oftentimes supplying both technical, trade, and popular names. By intent, references to toxicity are infrequent and meager. Through additional pages up to 1167 it serves as a well-condensed chemical handbook with numerous tables on such topics as indicators, buffers, radioactive isotopes, weights and measures, anti-freeze and cooling mixtures, specific gravities, name reactions, etc. This Index already is so well known to most industrial hygienists as to call for little review comment. Enough will have been said when it is announced: "The sixth edition is out!"

Public Health Reports

PUBLIC HEALTH REPORTS: Federal Security Agency, Public Health Service. Monthly Journal, Annual Rate $4.25.

THIS is not a review, but a salute. The venerable, but not anile, weekly *Public Health Reports* now has amalgamated with three of its kindred official publications to form a monthly *Public Health Reports*. Since near 1879, nearly every public health officer of the nation has lived with the "weekly" close to his elbow. The old format took no prizes at the periodicals show, and was a bit skimpy as to contents, but its years of life encompassed just about all that has taken place in public health. The new form is superb, and its designated board of editors, in themselves, provide assurance of expanded usefulness. This is no "newcomer" but a beloved friend all dressed up with a bigger than ever job to be

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done. Those past 70 years of experience presage a stable balanced future .

Health in Tropical Industry

INDUSTRY AND TROPICAL HEALTH: The Harvard School of Public Health. Robert W. Kelly Publishing Corporation, New York City, pp. 316, $10.00, Illustrated.

OVER the years, but with a fecundity that is lamentable, the Harvard School of Public Health has published a series of monographs related to occupational health. This may be the fourth of the group, but that point is not pressed. All have been of high order, but this last is without an equal. Near the end of 1950 some 50 leaders in industrial health, public health, and industry assembled in Boston for an Industrial Tropical Health Conference. This assemblage marked a realization that the need for occupational health is as wide as industry itself and industry is as wide as the world. With some pride it may be recognized that the elaborate industrial health establishments, fairly common in sections of the earth remote to us, chiefly stem from parent organizations in the United States. In full fashion, this Conference engaged in comprehensive appraisals of industry and health in the Middle East, the Far East, Tropical Africa, and Tropical America. Quickly came the understanding that, while many of the pressing needs in any portion of the world duplicate those of continental United States, others are distinctly peculiar to their own areas. While leishmaniasis does not disturb the Medical Director of a steel mill in Illinois, that disease is of enormous consequence to industry in tropical and sub-tropical climes. While malaria is not entirely remote to the United States, that disease, as an occupational affair, is rampant in some far-removed areas industrially linked to this country. On the other hand, the requirements of air conditioning in tropical Africa are engineeringly not dissimilar to those for Baton Rouge or Omaha. All such matters of scientific profusion entered the discussion. This book is the record. One of the prime benefits from the Conference was the organization of a permanent Industrial Council for Tropical Health. This book will stir the thinking of much larger numbers of industrial physicians, industrialists, and public health offices and agencies that inevitably will eventuate in an expanding concept of superior safeguarding of the workers the world over.

A Report on The Common Cold

INDICATIVE of the research on the common cold that is under way is the following by EUSEBIO Y. GARCIA, M.D., The Medical Research Clinic, Binan, Laguna, Philippines, in collaboration with DR. RAMON ACEVEDO, Aranta Institute of Agriculture, in the *Philippine Medical Reporter* (3:4, 1952). Under the title "Dimethylguanylguanidine Hydrochloride plus Sodium Sulfathiazole an Effective Anti-Cold Combination," DR. GARCIA reports: "The common cold is prevalent in all seasons of the year throughout the world. Workers along its etiology believe that it is initiated by a filtrable virus which is complicated later by secondary invading bacteria, such as, pyogenic cocci, *Hemophilus influenza*, *Pseudomonas aeruginosa* and other saprophytic fungi. With the advent of many antihistaminics which may abort cold by producing changes in the mucous membrane, many believe that the common cold has an allergic nature. However, in this work, we have ventured to treat colds without limiting ourselves to a particular etiologic agent. On the hypothesis that a cold cannot be treated by one drug alone, our search has been directed to combination of drugs. Fortuitously, out of the many antiviral, antihistaminic and antibacterial compounds tested, a combination of dimethylguanylguanidine hydrochloride (Flumamine) and sodium sulfathiazole has given us satisfactory results in both human and chicken colds. The dimethylguanylguanidine hydrochloride which has been evolved in our laboratory with a descriptive name of 'Flumamine' is apparently a new medical synthetic in so far as the literature on the subject is concerned. A 1% and 3% solution of this substance was prepared and mixed with corresponding equal amounts of 5% sodium sulfathiazole (Squibb). The course of treatment for man consisted of a daily intramuscular injection of 1 cc. of the combination (3% dimethylguanylguanidine HCL and 5% sodium sulphathiazole) intramuscularly daily for one or two days. Similarly the effects of sodium sulfathiazole might have been directed to the inhibition of secondary invaders which always complicate or modify the course of coryza especially during the later part of the second stage and the whole third. These two operational mechanisms acting in synergism to one another might have been responsible for the high percentage of recovery of human colds under combined Flumamine-sodium sulfathiazole treatment. The dramatic results of this combined treatment in chicken colds may justify the inference that this is quite specific to this particular avian respiratory disease. Its manner of action may be the same as that given for human colds. The multiplicity of the etiologic agents of the common cold and its complications has led us to search for a more effective remedy among the many antiviral, antihistaminic and antibacterial compounds. Out of the many tried, a combination of dimethylguanylguanidine HCL (Flumamine) and sodium sulfathiazole have given us satisfactory results in both human and chicken colds. Applied in 700 chicken colds where we isolated the cold virus, this combination produced 100% recovery after one calculated dose in 24 hours; while in 170 cases of human colds classified under the second and third stages we obtained an average of 85% recovery from all clinical symptoms. The average duration of the regimen of treatment was three days. What is practically new in this treatment is the dimethylguanylguanidine HCL which has been evolved in our laboratory as a synthetic analgesic, antiviral and antihistaminic. It is non-toxic and can be given by mouth and intramuscular injections. These properties and the inhibitive action of sodium sulfathiazole against secondary invaders have made up the rational basis in giving them in a combined form."

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ESTABLISHED 1932 — *Publisher:* A. D. CLOUD

Volume 21 — JUNE 1952 — *Number 6*

Production: United States versus Canada

RELIABLE information, but emanating from no official source, records the belief that the average United States workman will produce about 15% more of his wares than the average Canadian workman on identical jobs. This appears to be true when the raw stock, the necessary machinery, the working conditions, the working hours, etc., are the same insofar as similarity is possible. This same statement is said to hold even when the stimulus of incentive pay is provided.

It is widely believed, and perhaps proved, that the daily output for average workmen for European countries, including England but not necessarily including Russia for which country reliable data are little available, is far lower than the Canadian. However, rarely does a parity of machines and work conditions exist that permits of comparison on any assumption of identical circumstances.

Full explanation of this difference in percentage is not at hand, but European teams exploring the situation have arrived at the conclusion that the United States worker takes pride in his product and the rate of its production. Long ago, that statement might have been accepted without debate. Nowadays there is some indication that many United States workmen, particularly on machine jobs, are vastly and regrettably unconcerned over any high rate of production and knowingly engage in practices little conducive to high production. The old-time pride and joy of the genuine artisan is hard to find. Moreover, the wholesome, hearty Canadian is blessed with work traits that are known to engender a "work faithfulness" far outdistancing some other countries.

As an exception to all that has been said before, the old-time German workman in hand crafts, but not necessarily including machine operations, long has been recognized as achieving high and joyful productivity. In one instance, a group of German workers, unskilled in the work assignment, engaged in asbestos pipe insulation along with an identical group of United States workmen, in a military camp. It is probable that the United States workmen were somewhat more experienced with the task than their German fellows. Man for man, the Germans, without any competitive incentives, outstripped the Americans by nearly twofold. It should be clear, there was no enforced rate of labor. Apparently, the results sprang from no other impulse than spontaneous satisfaction in accomplishment.

BACK now to the immediate—that alleged 15% differential in the average output by United States workmen over Canadians on precisely the same task. For the time being, it is perhaps the part of wisdom to take the position that this differential is not proved. When proved, the situation calls for more than casual exploration. It would be gratifying to learn that the tradition of eager output is still so ingrained in the work life of the Americans of United States that despite many deterrents, high production persists. This Journal declines to believe that the much admired Canadian workman in any degree is just plain "pokey."

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Neglect Not the Gift

THERE was a time not to be dated as of the hoary past when all that ambitious youth needed, desiring to enter industry at the white collar level, was opportunity. All the rest, in Horatio Alger fashion, he took care of himself. Working diligently, in due course, he married the president's daughter and in good time became the company's president. Some possibility of discrepancy is involved, since there may have been an insufficient number of daughters to go around among the ambitious ones, and certainly there were few presidential chairs to be filled. Apparently, some were able only to attain to vice-presidencies and managerships.

Nowadays things are different. Opportunity has to be waved in full color before groups of little-ambitious youths inexperienced in painful diligence and demanding the president's daughter and the vice-presidency as part of the lure to any entry into industry.

In stark seriousness, one of the handicaps to industry, laden with opportunity, is difficulty in recruitment and the impartment of the almost-obvious that industry is teeming with opportunities. The astute industrialist is well alert to his obligation to build up the next generation of executives. Failure to do this spells disaster for oncoming years. All of this is objectively faced by Mr. William B. Given, Jr., in a publication in the *Harvard Business Review* for March-April, 1952, entitled "Reaching Out in Management," and to be enlarged in a forthcoming book under the same title. Excerpts from Mr. Given's abridged publication portray the amazing present-day situation in words far more striking than those commanded by this Journal:

"Asked to look back over the years and say what business problem has taken most of our time as company heads, many of us would answer that it has been getting good people into the company ranks and creating a set-up which will best develop their abilities. In order to strengthen the company, we have tried to give good men the top chance to succeed. Doing this has been our most important objective. Accomplishing it has been our most challenging task.

"It seems to me that, if we are to give our companies any permanence in today's fast and violently changing world, such an emphasis on the development of people is a continuing, indeed a growing, necessity. This necessity has been clear even though there have been times when war problems called for all-out attention, when great and not-so-great depressions had first call on our energies, when strikes and legislation preoccupied us, and when numerous other crises (a complete list of which would require better memories than any of us who have been around a long time possess) were temporarily more demanding.

"Actually, throughout the years, one effort has most consistently needed attention and taken the most hours—building a good team to carry on with the endlessly changing cycles of management challenges. And it is one effort which we cannot be excused from making by the many difficulties beyond management control. When long-range progress is not made in this particular area, we cannot put the blame on outside causes....

"Eric Johnston once said, 'Beaten paths are for beaten men.' That is true. Beaten paths lead to the cemeteries of business. Unfortunately, they are also the easiest to follow. The kind of company climate which encourages men to think in terms of new ideas takes a lot of just plain hard work. Management must continually train, continually coach. There should be a conviction throughout the company that the company heads are 'hell-bent' on the philosophy of reaching out, and will even at times be at least a shade ruthless in their purpose.

"The one permanent problem has been how to accumulate more potential managers and how to increase the effectiveness of people as they work together. Helping the individual to understand how to build his authority and to spread his interests, knowledge, and effectiveness is essential to that end."

THE bogging down and dropping aside of tomorrow's corporation president or executive vice-president or auditor is not always the failure of youth. Some failures are created by well-meaning, but little-visioned and little-planful executives already installed in industry—one generation ahead of youthful newcomers. In any large corporation there are many types of minds functioning along highly dissimilar lines, but ably performing their own immediate tasks. Some are truly poisonous in their unknowing hampering of the next generation of executives. Little known to them is the fact, obvious to others, that no single associate of lower rank possibly could assume the executive's duties when the need arises. There are no understudies. And where does industry's Medical Director enter this predicament? In the midst of his multitudinous obligations is that other obligation to foster in high and low places the full significance of praiseworthy human relations. Even the most recalcitrant of executives under the tutelage of the able Medical Director may come to understand.

NEWS, COMMENT, OPINION

INCUMBENT on every physician, whether or not he is personally suited for office, is the discharge of the obligations that suffrage has laid on him. Inescapably linked to a moral and ethical leadership that his attainments and the sanctity of his services have given him, the physician is faced also with the responsibility of exercising leadership in the plainest and most obvious duty of citizenship —that of going to the polls and casting his ballot.

—From "Physician as Citizen," in *New England J. Med.*, 246:16 (April 17) 1952.

That Scratch

TAKE BETTER CARE of that tiny scratch or minor cut. According to American Mutual Liability Insurance Company, about 20% of the 400,000 disabling hand injuries sustained each year result from infection. Most important of all, says the company's Institute for Safer Living, is cleansing: it's 85% of the battle. Sterilizing rates only 10%; protection 15%.

—*Occupational Hazards*, April, 1952.

Bert Hanman's Book

BERT HANMAN'S book, "Physical Capacities and Job Placement," first published in Sweden, is now available in the United States. The American publication date was May 19. Copies may be obtained from JOHN DE GRAFF, INC., 64 West 23rd Street, New York 10. The price is $5.00. This book was reviewed by CLARK D. BRIDGES in this Journal (*Indust. Med. & Surg.*, 21:2, 90 (February) 1952).

Insect Control

AT THE present time there are over 625,000 species of insects known and classified, while approximately 215,000 species of all the other animals are known. Entomologists have given varying estimates of world insect populations, but one of the best known statements places the total weight of all insects as greater than that of the weight of all other forms of animal life. The human population of the world is slightly over two billion. There are probably that many insects in and on every square mile of the earth excluding deserts and polar regions. Flies represent one of the major public health problems of the world. It has been estimated by Dr. W. B. Hermes, that under ideal circumstances it is theoretically possible for the offspring of a single pair of flies from April to August to cover the entire earth's surface 47 miles deep, allowing ⅛ of a cubic inch per fly. These statements give some idea of the reproductive capacity of insects in general and the need for control of the insect population. The loss caused by insects to crops and other products used by man has been estimated at four billion dollars per year.

—*Tennessee Industrial Hygiene News*, April, 1952.

Sports Activities

PARTICIPATION in company-sponsored sports activities by over-ambitious, over-weight, or over-age workers should be limited to the physical capacity of the individual, is the thesis of an editorial in the February 16 issue of *J.A.M.A.* "As the Boxing Commission has done in New York, industry can care for its over-ambitious, over-weight and over-age 7:00 P.M. athletes, by determining before the season begins that all applicants for the plant team can meet the rigors of competitive sport," the editorial stated.

—*Texas State J. Med.*, April, 1952.

Guess Who

A CONGRESS of psychiatrists in Atlantic City was told by Dr. Joost M. Meerloo, an adviser to the Dutch government during World War II, that psychiatry would be useful in pacifying political leaders and calming "many panicky reactions." Dr. Meerloo suggested that psychology could clarify the thinking of politicians in danger of succumbing to hysteria, but he said, rather sadly, that politicians seem afraid of it. This is understandable, for a great many statesmen might be led away by the little men in the white coats if they were properly analyzed. A rule of thumb judgment would be that the Messrs. —— and ——, with their constant preoccupation with "emergency," "crisis," and "war," were fit subjects to play with the blocks. The results of such a test would be informative.

—*Chicago Tribune* (title added).

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Staff Positions: (125): Large Chicago Company. 44 hour week; to $8000. (126): Take over medical installation; large plant; some emergency surgery; town 45,000 near Chicago. (127): Large Michigan Company; minor surgery; $800. (128): Niagara Falls plant; good salary and potential. 129): Dispensary work; large rubber Company. (130): Western Mining Company; also private practice; company pays $600 and extras for obstetrics and surgery; fine hospital office free. (131): Full or part time; St. Louis plant. (132): Pre-employments, rechecks and first aid; EKG's and X-ray; near university; Wisconsin. (133): Railroad Company; requires Pennsylvania license; traveling. (134): Tennessee and New Jersey plants of leading Company; will pay costs for personal interview. (135): For large construction project; pay transportation costs; Florida. (136): Kansas plant of large Company; read EKG's; near university. (137): To supervise home office dispensary and conduct important aspects of office and administrative employee medical program; large Company; Philadelphia. (138): Important airline; prefer doctor with flight surgeon experience; headquarters in city; $700. (139): Large Oil Company; city, 400,000; SW. (140): Industrial clinic; 5½ day week; Chicago. (141): large operation; five first aid stations; 30 bed hospital; to $800; South. (142): Doctor and wife (nurse) combination; total income will reach about $15,000; plant and private practice; Pacific North West. (143): For large medical department; Chicago "loop" building; office employees medical program; substantial with good potential. (144): Arizona; with private practice will reach $10,000. (145): New Mexico plant; all phases industrial medicine; full or part time; large city.

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Alcohol and the Liver

EVIDENCE that a large proportion of cases of cirrhosis of the liver may be alcohol-induced is revealed in a resumé of recent findings of distinguished European scientists. In contrast to propaganda of moderationists, the conclusion of these scientists assembled by Ernest Gordon is that from 50 to 100% of deaths from cirrhosis of the liver, over various recent periods, have been found to have been induced by consumption of alcoholic beverages. Summed up in an important French volume, "L'Alcoolisme," Prof. Dr. Paul Perrin, who published this survey in 1950, quotes from eight French medical authorities who conclude that cirrhosis and stomach ulcers are among the most significant ailments of alcoholics. The findings of these French scientists are strongly in agreement with the reports of the Registrar-General of Births, Deaths and Marriages, in England and Wales. Therein it is stated that among brewers and saloonkeepers, deaths from liver diseases are nearly seven-fold greater than among the people taken as a whole.

—Release, American Business Men's Research Foundation.

Survival in a Disaster

EIGHT rules followed in time of disaster may save a life, says Dr. Walter H. Roehll, Middletown, Ohio, who was the only physician aboard the streamliner, "City of San Francisco," when it became snowbound in the Sierra Nevada mountains last January. "In any disaster—potential or real—the key work is conservation; conservation of energy, of food, of water, of worry and of all physical, mental and spiritual stock," said Dr. Roehll. The rules, which appear in a story in the April issue of *Today's Health* (published by the A.M.A.) are: (1) Keep calm and conserve your energy. (2) Though you may feel the world has abandoned you, actually you can be certain that every effort is being made to effect your rescue. (3) Don't worry too much about food. It's a relatively simple matter to survive a surprisingly long while on extremely reduced rations. (4) Do worry about water. It is far more essential, both for sanitation and for drinking. (5) Always carry a flashlight in your traveling gear and a supply of some oral antibiotic, with directions for its emergency use supplied by your physician. (6) Don't leave the rest of the group. You may find it impossible to return and it may cost the lives of others who go in search of you. (7) Make the best possible use of the skills of those in the party. A calm woman often can be as useful as a skilled nurse. (8) Improvise. Fresh air is almost as good as oxygen. A few drugs can go a long way. In almost any crowd there is someone who understands first aid and artificial respiration.

—*Hospital Topics*, April, 1952.

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The Vitamin Base

EMIL C. BEYER, M.D., Medical Consultant to the Ethyl Corporation and the Machlett Laboratories, told a group of industrial nurses in the Hotel Taft yesterday that the newer "wonder drugs" are viewed with "great skepticism" by doctors. Commenting on recent reports of a specific cure for tuberculosis, he said to the 130 Connecticut nurses who were guests of the American Mutual Liability Insurance Company at a Seminar on Industrial Nursing, that spectacular "improvements" in many cases treated with the recently announced drug, may stem from the vitamin base from which the drug is made, rather than the drug itself. The vitamin base, he said, might conceivably increase the patient's appetite and thereby improve his over-all condition.

—*New Haven Register*, April 9, 1952.

How Life Began

THE theory that life on earth may have begun spontaneously through the chance chemical union of organic compounds floating in prehistoric seas well over a billion years ago was expounded by Dr. G. W. Beadle, geneticist of the California Institute of Technology, at a recent Mills College Centennial Symposium on evolution. Because there are no longer masses of organic compounds from which such life may have sprung, he thinks the process cannot be repeated again. It may have taken as long as thousands or even millions of years for the first "living molecule" to produce a second like itself, in Dr. Beadle's opinion. "But somewhere, somehow," he said, "a chance combination of compounds must have acquired a new property it never had before—the ability to duplicate itself and to undergo mutation. This presumably was the precursor of all present living things." Development of this first bit of life to even the simplest alga perhaps represents a greater step in evolution than the development from ameba to man. The process may have taken a billion years. Viruses, according to Dr. Beadle, are at both the beginning and the end of the scale of living things. Not only are they like the first probable form of life, but they are also the final stage of degeneration of higher forms of living things under conditions of parasitism. "All during the process during which living things have been evolving to give increasingly complex forms, evolution has been going on in the other direction as well," he said.

—From "Science in Review," edited by WALDEMAR KAEMPFFERT, in *New York Times*, May 11, 1952.

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—From "How to Keep Well," DR. THEODORE R. VAN DELLEN'S column, in *Chicago Tribune*, May 15, 1952.

Prize

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in the field of Industrial Medicine and Surgery. The purposes are: (1) To stimulate original thinking among the younger group who are to be eligible. (2) To encourage publication of worthwhile studies and procedures. (3) By direction of thinking toward industrial health problems, to attract desirable graduates into the field of Industrial Medicine and Surgery. Any physician in the Chicago area who has received his M.D. degree within the six years immediately prior to the date closing the contest (March 1) for the current year is eligible. Three judges, one from each of two medical school faculties, and one from the membership of the Society, have the authority to withhold the award if a paper of sufficient merit has not been submitted. The paper must present original laboratory or clinical ideas or research data pertaining to industrial, medical or surgical subjects. It will be judged on originality, prospective or proved value of application in practice, and clarity of presentation. It shall not have been previously published or presented at a meeting. Subsequent to the award, the author will publish the paper in a suitable scientific journal with an attached notation of the award. The manuscript with two carbon copies submitted for the contest should not be signed by the author, but should be identified by detached letter and mailed to the secretary of the Society, who will then identify each by number and forward to the judges. The manuscript is to be submitted not later than March 1 each year. The paper and award will be presented at the annual meeting of the Society.

They Demand Improvement

THE NATIONAL DOCTORS COMMITTEE for Improved Federal Medical Service, ROBERT COLLIER PAGE, M.D., chairman, recently polled 2,100 doctors representing every branch of the medical profession in all 48 states, with results as follows: *General:* 99.4% believe that the Federal medical system needs immediate improvement; 98.2% believe the 35 competing Federal medical systems should be coordinated (however, 78.8% feel that S.1140 is too big a step at one time); 84.3% believe a Federal Medical Board with full authority to facilitate bed needs, and, by implication, implement as many Hoover Commission's recommendations as possible by administrative action, should be created (such a Board is recommended by the AMA and might well be a compromise evolved by the Sub-Committee on Reorganization); *Armed Services:* 60.7% believe the armed forces medical systems should not be included in the proposed Department of Health; of those disapproving of combining the armed forces and civilian medical systems, 73.7% feel the armed forces should coordinate the three branch systems among themselves. *Veterans:* 87.5% believe the VA medical system should be included in the proposed Department of

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Health; 95.9% believe steps must be taken immediately to stop abuses in handling non-service connected cases. *American Medical Association:* 96.1% believe the AMA should present a scientific constructive program to Congress instead of merely opposing S.1140; 96.2% feel the AMA and the National Doctors Committee should iron out their differences and present a united front to Congress. *National Doctors Committee:* 93.9% believe the National Doctors Committee should continue to function until every effort has been made to obtain favorable action during the present session of Congress (only seven out of 1001 doctors feel the Committee should disband); 94.3% believe the profession has an opportunity it may not have again for many years to obtain legislation to improve the Federal medical system and halt the trend of increasing government medicine.

Appetite and Blood Sugar

FROM a quiet red-brick building at Harvard's Department of Nutrition has just come an announcement which may be the answer to America's number-one health problem: What makes Jack Spratt eat till he's fat? These findings may restore to diet menus small amounts of that often-banned food—sugar. What started Harvard on this research? "You can't explain overweight by saying a man eats too

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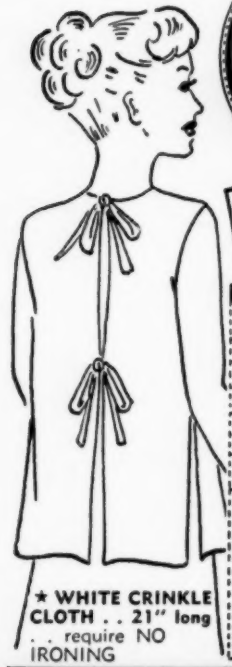
much, any more than you can say that alcoholism is due to drinking too much. This is obvious, but not an explanation," reasoned Harvard's Dr. Jean Mayer, who set out two years ago to uncover why some people overeat. Science has known little more about America's 25 million overweights than what every friend of a fat man knows: He's a slave to his appetite. What controls appetite? Harvard contends that it is controlled by a small area of the brain at the back of the head. One investigator, Dr. Norman Jolliffe, of New York City's Bureau of Food and Nutrition, has even given this brain section a name: the "appestat"....suggests that fat people retrain their "appestats." "It isn't that simple," Harvard researchers maintain (overweights know it too). Dr. Mayer, using experimental rats in Harvard laboratories, removed the appetite-regulating sections of their brains. Deprived of their "appestats," they ate enormously, became obese. Simultaneously, the blood-sugar levels of these animals registered very low. Suddenly, the animals stopped eating heavily; and at that point, their blood-sugar levels were normal once more, or high—indicating that blood-sugar level must now be recognized as an important factor in appetite control. A volunteer group of Boston overweights came to the laboratories regularly. These patients, like the animals, were measured for blood-sugar levels, on various diets. Again, researchers found a striking link between low available blood sugar and ravenous appetite. From all this, the Harvard scientists conclude that the effective blood-sugar level (about which dieters have heard so little till now) may be the "signal" which governs our appetites. Note the word "effective." In some cases of diabetes, or where cortisone has been given, the actual blood-sugar level may be high, but not effectively used by the body.

—*Look*, May 6, 1952.

Committee Subjects

DISCUSSED at our meetings were post-graduate courses in industrial nursing at Yale University; affiliation of health and safety activities under the same administrative head, and the growing recognition of safety as a specialty; liaison between this Committee and the State Dental Association; legislative hearings on compulsory sickness indemnity insurance and workmen's compensation concerning free choice of physicians; requests for starting programs in industry to refer alcoholic cases to both out of state and in-state clinics; apparent attempts to bypass existing plant medical facilities by interested professional and lay groups in their approach to industry through other plant departments on this problem; the request from the State Director of Civil Defense for the assistance of this Committee in studying medical aspects of Civil Defense problems in industry and assistance in recommending equitable stockpiling of supplies; and the inauguration of Health Services for State employees.

—From a report of the Committee on Industrial Health, RICHARD J. HINCHEY, M.D., Chairman, in *Connecticut State Med. J.*, May, 1952.



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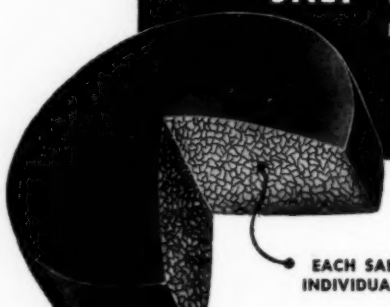

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